Maple District Fisheries Management Plan 1989 - 2000

Ontario

Ministry of
Natural
Resources

Vincent G. Kerrio
Minister

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MAPLE DISTRICT FISHERIES MANAGEMENT PLAN

1989-2000

December, 1988

PREFACE

This Fisheries Management Plan was prepared within the general context of the Maple District Land Use Guidelines (DLUG) (OMNR 1983), to facilitate long-term fisheries planning in Maple District from 1989 to the year 2000. The management strategies and tactics presented in this plan were submitted for public review in the Maple District Fisheries Management Plan, Background Information Summary, Strategies and Tactics and the Maple District Fisheries Management Plan, Draft. Public input from that process has been incorporated into the final plan.

Sections 1 and 2 of this report present a brief overview of the planning process for fisheries in Maple District, the attributes of the fisheries resource, current management practices, problems and issues facing fisheries, and resource use targets. Section 3 outlines the strategies and tactics that have been adopted to achieve such objectives as protecting and rehabilitating fish populations and fish habitat, providing fishing opportunities, and expanding fisheries education, research and public involvement programs. Section 4 presents an implementation schedule for the first five years (1989-1993) of the planning period. Appendix 1 contains detailed strategies and tactics for each watershed or mangement zone in Maple District.

C.I. Goddard
District Manager,
MAPLE DISTRICT

A. S. Holder
Regional Director,
CENTRAL REGION

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1.0 INTRODUCTION

Maple District is located in south-central Ontario (Fig. 1), and is comprised of Metropolitan Toronto and the regional municipalities of York, Peel and western Durham. The District had a population of 3.1 million people in 1985, or 35% of the population of Ontario. There are 1,401 km (1,237 ha) of rivers, 445 ha of inland lakes, the lower half of Lake Simcoe (approx. 36,250 ha) and 8.3% of Lake Ontario (approx. 165,750 ha) in Maple District. Because Maple District encompasses significant portions of both Lakes Simcoe and Ontario, management planning for these waters is included in this document. All relevant Ontario Ministry of Natural Resources (OMNR) Districts and Fisheries Assessment Units have participated in fisheries planning for Lakes Simcoe and Ontario, and will cooperate in their management. A separate planning document is being prepared for Lake Ontario as a whole.

1.1 Purpose

This plan has been prepared to direct fisheries management in Maple District to the year 2000. The purpose of this report is to:

i) present a brief overview of the fisheries management planning process

ii) summarize estimates of present and future fisheries production and use

iii) present approved fisheries management strategies and tactics

1.2 Planning Process

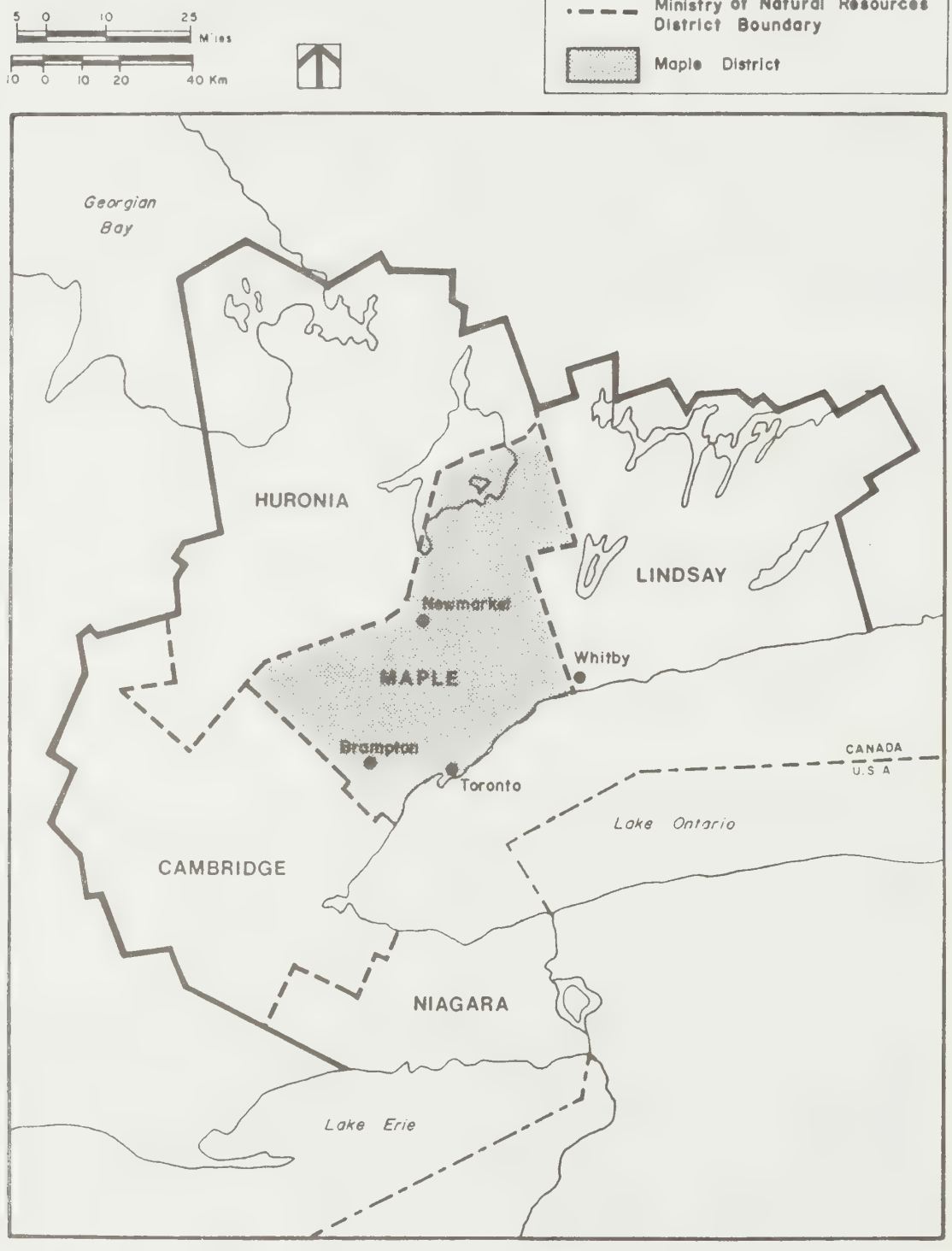
The Maple District Fisheries Management Plan follows the direction of resource planning outlined in the Maple District Land Use Guidelines (DLUG) (OMNR 1983), and in earlier planning initiatives such as the Southern Ontario Co-Ordinated Program Strategy (SOCPS) and Strategic Planning for Ontario Fisheries (SPOF).

The original fisheries targets and management direction identified in the District Land Use Guidelines in 1983 were formulated with the best available information. Some of this data was taken from provincial surveys which gave coarse results at the district level. For example, the sport fishery targets developed from the 1980 Sportfish Angler Survey were generally too high. During the fisheries management planning excerise, new data was used to formulate more realistic and up-todate targets. With approval of the District Fisheries Management Plans, the District Land Use Guidelines have been amended simultaneously to reflect changes in fisheries targets and management direction.

Several reports have been prepared to guide and document fisheries planning in Maple District. The Terms of Reference (OMNR 1987a) specified the scope, process and timing of all planning activities. District fisheries data and related information have been compiled in the Maple District Fisheries Background Report (OMNR 1987b), and summarized along with optional management strategies and tactics in the Maple District Background Information Summary, Strategies and Tactics (OMNR 1987c). Public input was

FIGURE 1

MAPLE DISTRICT
REGIONAL SETTING



solicited on the preferred management strategies and tactics presented in the Maple District Fisheries Management Plan, Draft (OMNR 1988). These documents are available for public review at the Maple District Office, P.O. Box 7400, 10401 Dufferin Street, Maple, Ontario, L6A 1S9 (416-832-7208), and should be consulted if more detailed information is required.

1.2.1 Public and Interagency Input

Appendix 2 presents a summary of public and interagency input to the draft plan, including a chronology of publicity and meetings and a synopsis of comments.

Comments on the draft plan were recorded at the public meetings of March 21 and 23, 1988. In addition, 28 questionnaires (Appendix 2) and a few written and telephone responses were received. Appendix 2 also contains an abridged version of all public comments on the draft plan. Many other observations, questions and ideas from the public remain on file to assist in the implementation of the final plan.

In general, comments were very positive and constructive, and supported the intent of the plan. Specific projects that received support included the re-introduction of Atlantic salmon, the institution of special regulations (e.g. gear restrictions, slot limits, catch-and-release), interest group involvement and cooperation, and habitat rehabilitation. Issues of most concern included angler access, enforcement and the stocking program.

Comments on the draft plan were also recorded during interagency meetings held on March 29 and 31, 1988. Again, the overall intent of the plan was well received and strongly supported. Issues that were of concern are summarized in Appendix 2. A coordinated and cooperative approach with these agencies is recognized as essential to the implementation of the fisheries plan and ongoing fisheries planning exercises. Discussion focused on other issues such as the plan input and review process, and fisheries protection guidelines including vegetative buffers, construction timing, "no net loss" of habitat and stormwater management criteria.

A report entitled A Summary of Public and Interagency Input to the Maple District Fisheries Management Plan, Draft (OMNR 1989) has been prepared. This report contains complete information on the public consultation process including recommendations for obtaining input on specific fisheries issues in the future.

1.3 Existing Policies and Technical Direction

This plan adheres to current Ministry of Natural Resources corporate policies, and is founded on an integrated resource management approach. Integrated resource management encourages sustainable multiple use, and coordinates management to ensure that conflicts are minimized and management programs that benefit more than one use are encouraged. An integrated approach to fisheries management is critical since many aspects of land and water use affect fish habitat. Management of a healthy fisheries resource may be viewed as the "most sensitive use" of an aquatic ecosystem. If the habitats that healthy fish communities require for spawning, rearing and growth are protected, then virtually all other potential uses of the system, including human uses are also protected. Where fisheries and aquatic habitats have been degraded, the Ministry will undertake an active role in their rehabilitation, so that desirable uses are restored. An integrated

approach is also important on waterbodies which are located in more than one district. For example, Lake Simcoe which is located in Maple and Huronia districts is managed as a single unit under the direction of the Lake Simcoe Management Committee. Management responsibilities are shared between the two districts.

2.0 FISHERIES OF MAPLE DISTRICT

2.1 The Fisheries Resource

The Oak Ridges Moraine is an interlobate moraine (Fig. 2) that divides Maple District into a Lake Ontario watershed on the south and a Lake Simcoe watershed on the north. Several distinct aquatic habitats can be recognized in Maple District: coldwater streams, warmwater streams, inland lakes and ponds, Lake Simcoe, Lake Ontario, and headwater, riverine and estuarine wetlands. Maple District waters support at least 19 species of gamefish and approximately 50 species of non-game fish. These include the redside dace (Clinostomus elongatus), recently designated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as a rare species in Ontario (Fig. 3), and the Lake Simcoe whitefish (Coregonus clupeaformis spp), designated by COSEWIC as threatened.

There are 303 ha (596 km) of coldwater streams in Maple District (Fig. 3). Most of these arise on the Oak Ridges Moraine, and support resident populations of brook and/or brown trout.

There are 934 ha (805 km) of warmwater streams (Fig. 4) in the District, supporting species such as smallmouth bass, walleye, rock bass, bullhead, suckers and creek chub.

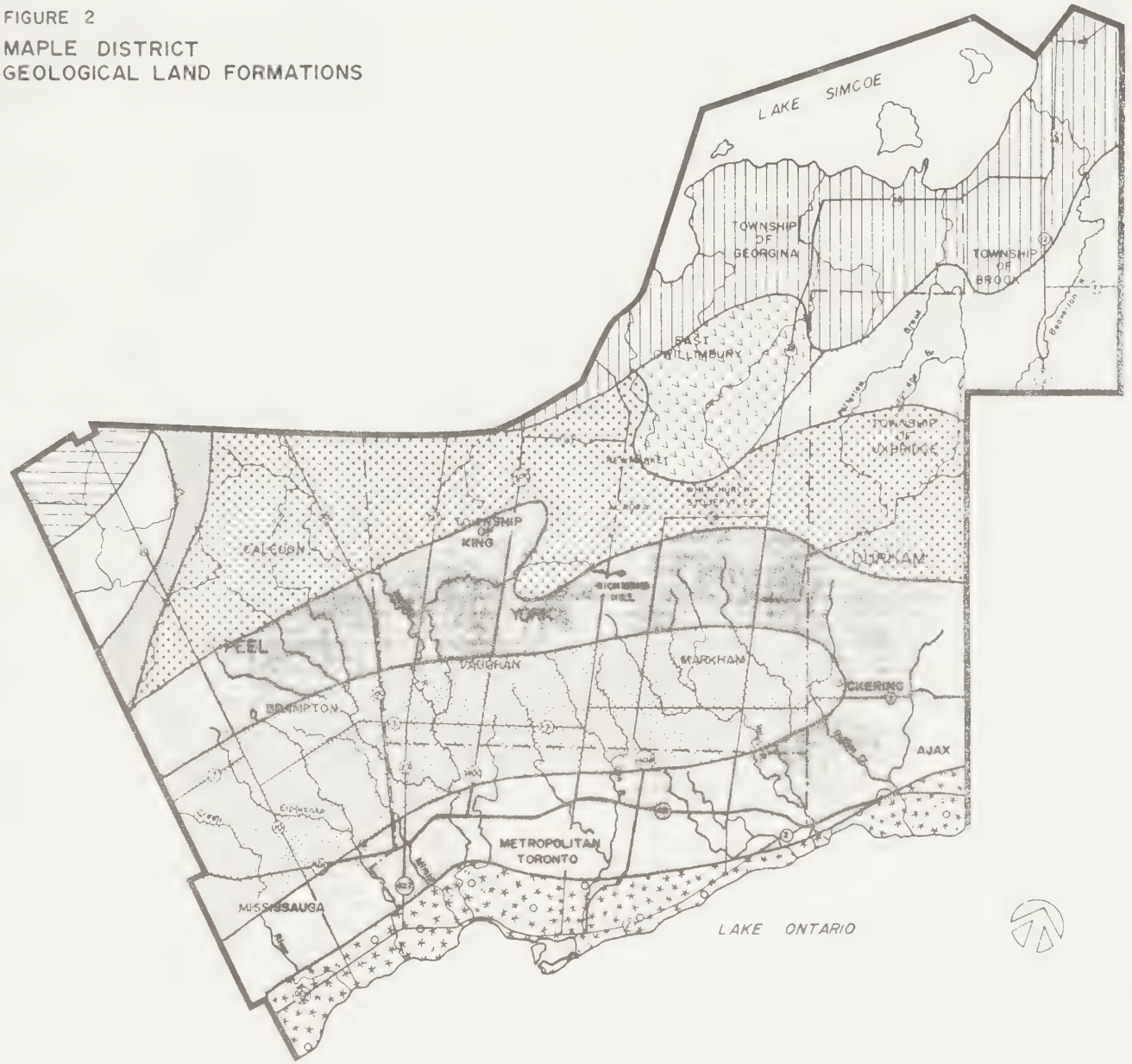
Maple District has 76 lakes and ponds ranging in size from 0.8 to 33.1 ha (Fig. 5), supporting coldwater fish such as brook trout and rainbow trout, and warmwater fish such as yellow perch and largemouth bass. Only eighteen (24%) of these lakes (6 coldwater and 12 warmwater) are accessible to the public.

Lake Simcoe supports a coldwater fishery of lake trout, lake whitefish, lake herring and rainbow smelt, and a warmwater fishery of northern pike, largemouth bass, walleye, yellow perch and smallmouth bass (Fig. 6). Lake Simcoe also supports the largest winter fishery in Ontario. There are 35 commercial ice-fishing hut operators. In recent winters ice fishing effort on Lake Simcoe has been about 118,000 angler-days. Thirteen charter boat operators fish Lake Simcoe fish during the open water season.

In Lake Ontario an assemblage of introduced fish species has filled a niche left vacant when habitat destruction, overharvest and predation by sea lamprey decimated native fish stocks during the 1800's and early 1900's. Lake Ontario now supports a small warmwater fishery in the nearshore zone, and a large coldwater fishery for chinook salmon, coho salmon, brown trout, rainbow trout and lake trout in both nearshore and offshore waters. This fishery is supported largely by stocking. In 1987 there were 247 charter boat operators along the Toronto waterfront, harvesting 116,153 kg of salmonids. Rehabilitation stocking programs in Lake Ontario are helping to re-establish stocks of lake trout and Atlantic salmon. Excellent runs of rainbow trout have become established in the streams east of Toronto.
According to the Ontario Wetlands Evaluation System, there are 37 provincially significant Class 1 to Class 3 wetlands (11,900 ha total area)

FIGURE 2

MAPLE DISTRICT
GEOLOGICAL LAND FORMATIONS



LEGEND

- HILLSBURG SANDHILLS
- OAK RIDGES MORAINE
- SCHOMBERG CLAY PLAINS
- PETERBOROUGH DRUMLIN FIELD
- SIMCOE LOWLANDS
- SOUTH SLOPE
- PEEL PLAINS
- IROQUOIS PLAIN
- GUELPH DRUMLIN FIELD
- NIAGARA ESCARPMENT

SCALE

FIGURE 3

MAPLE DISTRICT

COLD WATER FISHERIES AND
KNOWN LOCATIONS OF REDSIDE DACE

LEGEND

- STREAM RESIDENT COLD WATER FISHERIES
- MIGRATORY RUNS OF COLD WATER SPECIES
- KNOWN LOCATION OF THE REDSIDE DACE

SCALE

0 5 10 15 20 Km

0 4 8 12 Miles

FIGURE 4
MAPLE DISTRICT
WARM WATER FISHERIES

LEGEND

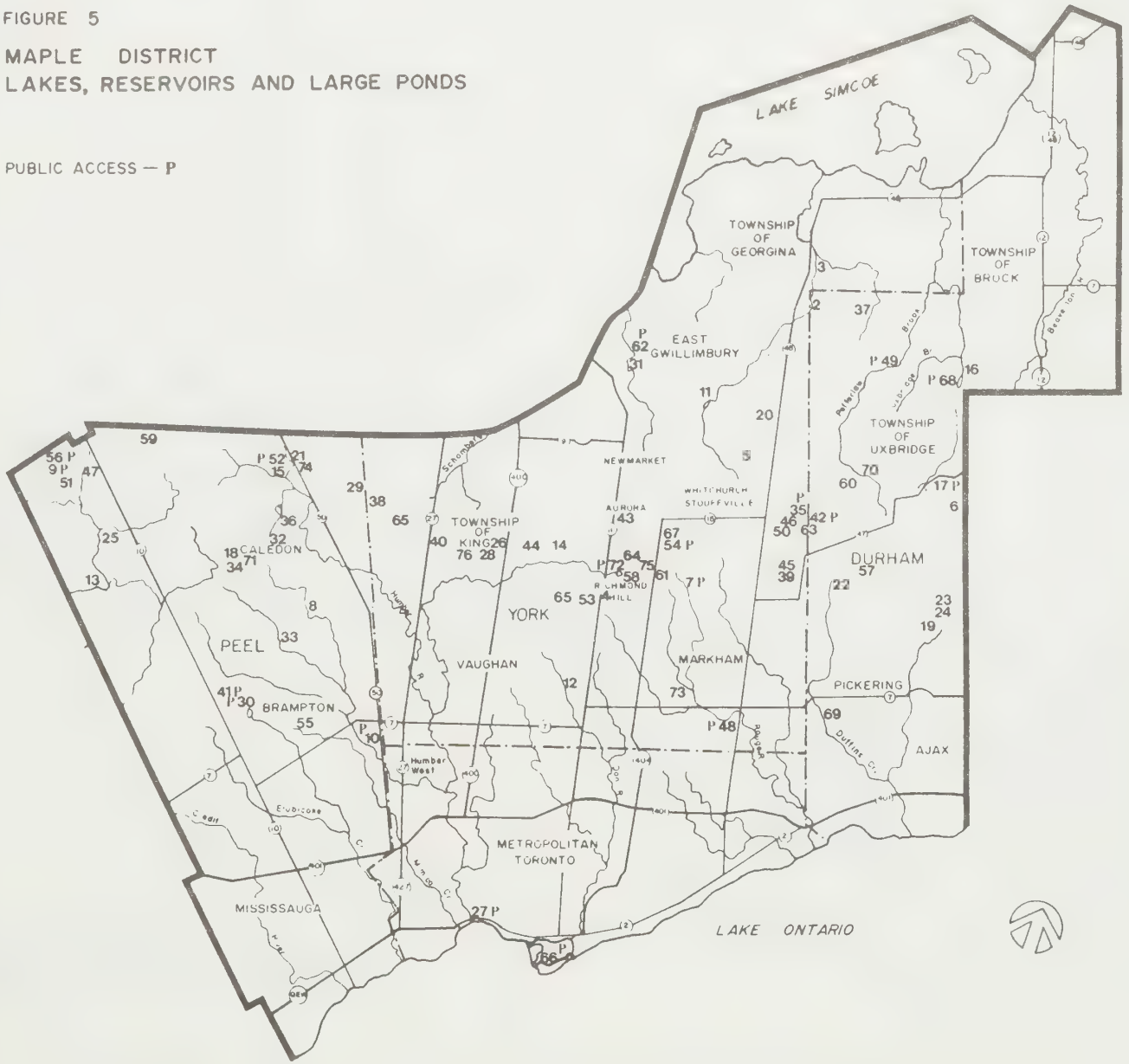
KNOWN WARM WATER FISHERIES

SCALE
0 5 10 15 20 Km
0 4 8 12 Miles

FIGURE 5

MAPLE DISTRICT
LAKES, RESERVOIRS AND LARGE PONDS

PUBLIC ACCESS — P



LEGEND

1 Albion Hills Ponds
2 Baines Pond
3 Baldwin Reservoir
4 Bond Lake
5 Boylens Pond
6 Brookdale Lake
7 Bruce's Mill Pond P
8 Bruce's Pond
9 Caledon Lake P
10 Claireville Reservoir P
11 Dike Pond
12 Don Head Pond
13 Dufferin Lake
14 Eaton Hall Lake
15 Eldridge Pond
16 Electric Light Pond
17 Elgin Pond P
18 Elliot Lake
19 Fiss Pond
20 Franklin Mill Pond
21 Frank's Pond
22 Glasgow Glen Pond
23 Glen Major Upper Pond
24 Glen Major Middle Pond
25 Green Lake
26 Gregioch Lake
27 Grenadier Pond P
28 Hackett Lake
29 Hall Lake
30 Heart Lake P
31 Hidden Lake
32 Hunter's Pond
33 Humber River Pond
34 Innis Scott Lake
35 Island Lake P
36 Johnston's Pond
37 Joseph's Lake
38 Kennifick Lake
39 Lehman's Pond
40 Loch Erne Bells
41 Loafer's Lake P
42 Long Lake P
43 Lumsden's Ponds
44 Marie Lake
45 Mathew's Pond
46 McKeown Lake
47 Mill Pond
48 Milne Reservoir P
49 Mud Lake P
50 Musselman Lake
51 Orpens Pond
52 Palgrave Pond P
53 Phillips Lake
54 Preston Lake P
55 Professor's Lake
56 Second Caledon Lake P
57 Secord Pond
58 Shadomere Lake
59 Sharon Lake
60 Siloam Pond
61 Simeon Lake
62 Soldier's Bay P
63 Staley Lake
64 St. George Lake
65 Thompson Lakes
66 Toronto Islands Ponds P
67 Van Norstrand Lake
68 Wagner Lake P
69 Whitevale Pond
70 Widdifield Lake
71 Widgett Lake
72 Wilcox Lake P
73 Willow Pond
74 Gibson Lake
75 Haynes Lake
76 Kelly Lake

SCALE

0 5 10 15 20 Km
0 4 8 12 Miles

FIGURE 6

LAKE SIMCOE
FISHING ZONES

LEGEND

CENTRAL BASIN — Cold Water Fish Zone
Lake Trout, Whitefish, Herring, and Smelt

SHORELINE — Warm Water Fish Zone
Fish Species Listed Below

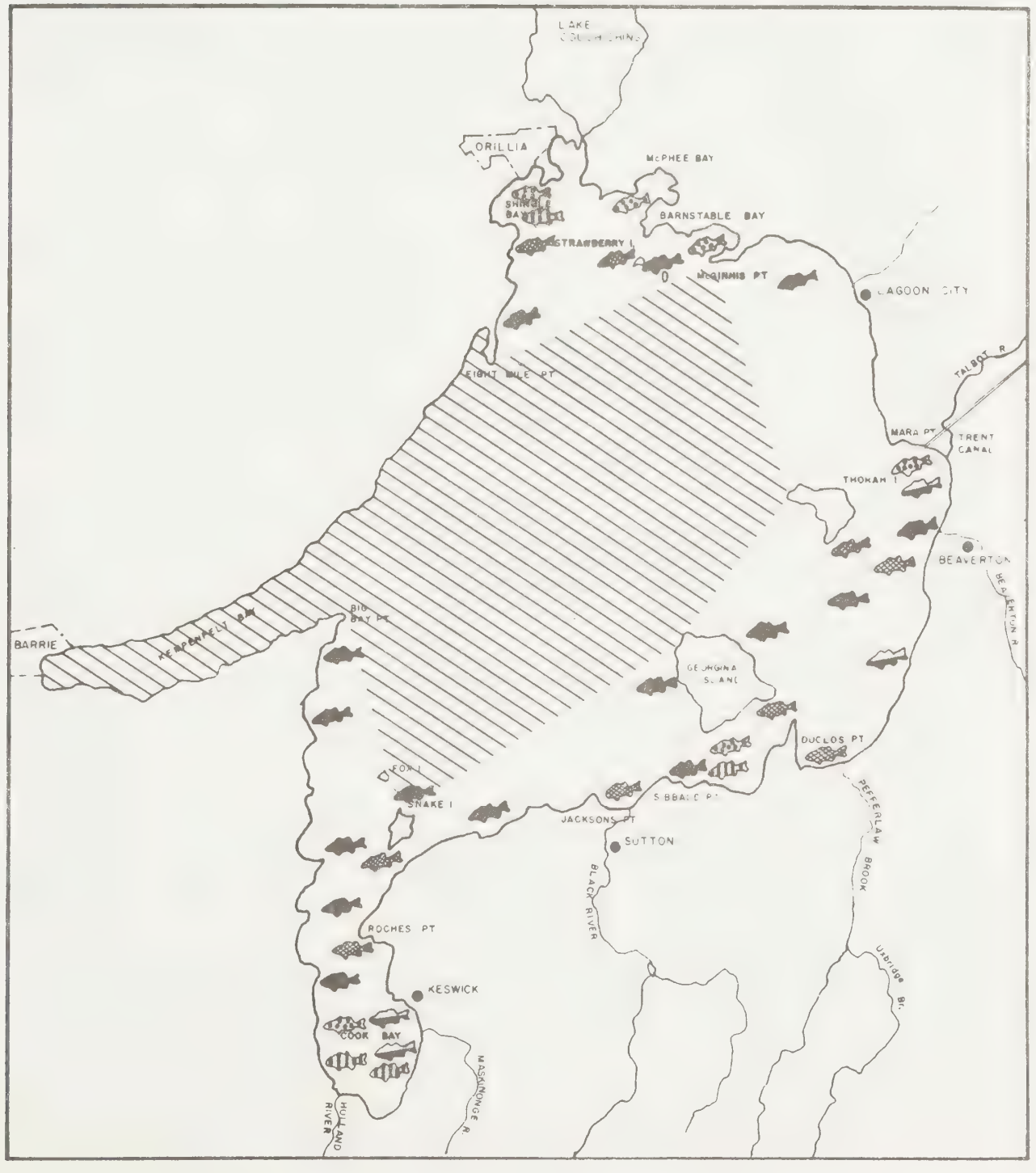
PIKE

LARGEMOUTH BASS

YELLOW PICKEREL (WALLEYE)

YELLOW PERCH

SMALLMOUTH BASS



in Maple District (Figure 7). Since fisheries represents only one component of the Ontario Wetlands Evaluation System, all wetland classes 1 through 7 can potentially hold importance for fisheries. As of December 1987, 90% of Maple's wetlands had been evaluated. Wetlands are of key importance to fisheries in Maple District because they can provide spawning and nursery habitat, and because they help to regulate water quantity and quality.

In addition to active sports fisheries on all of the waters described above, Maple District has commercial baitfish fisheries on Lake Simcoe and on rivers throughout the district, and 2 commercial food-fish fishermen, one on each of Lake Simcoe and Lake Ontario.

Fish viewing is popular in Maple District, particularly during spawning runs when fish may be observed from dams and bridges on the lower reaches of Lake Simcoe and Lake Ontario tributaries. The Lake Simcoe spring runs of walleye, northern pike and white sucker, and the Lake Ontario spring and fall runs of salmon and trout attract the most viewers.

2.2 Potential Yield

Potential fish yields from Maple District waters, summarized by fishery, are presented in Tables 1, 2 and 3. These estimates will be refined as additional data and methods of calculation become available.

The total potential yields of coldwater and warmwater inland lakes, exclusive of Lake Simcoe and Lake Ontario, are 552 kg/yr and 2,976 kg/yr, respectively. These estimates were based on the morphoedaphic index (MEI), which is a function of lake size and dissolved nutrients and provides a means of estimating fish production.

Estimates of potential yield from Maple District streams and rivers were based on the best available productivity data from southern Ontario. The total potential yield of coldwater streams is 1,339 kg/yr, which includes a baitfish component of 1,010 kg/yr. The total potential yield of warmwater streams is 23,995 kg/yr, which includes a baitfish component of 22,021 kg/yr.

Yields for the Credit River are presented separately in Table 1, because of the importance of this fishery. Total potential yield of the Credit River is 509 kg/yr of resident species for coldwater reaches, and 3,135 kg/yr for warmwater reaches.

The total potential yield of sport fish species in Lake Simcoe (MEI estimate) is 321,900 kg/yr (Table 3). Baitfish yield of Lake Simcoe was assumed to be equal to the average of the recent annual harvests, or 39,870 kg/yr. Maple District waters of Lake Simcoe account for about 50% of the total yield.

The potential yield of Lake Ontario waters within Maple District is 509,000 kg/yr. This estimate includes fish production derived from both natural recruitment and hatchery stocking, and represents 26% of the total potential yield for Canadian waters of Lake Ontario, excluding the Bay of Quinte.

FIGURE 7

MAPLE DISTRICT
SIGNIFICANT WETLANDS
(O.W.E.S. CLASSES 1-3)

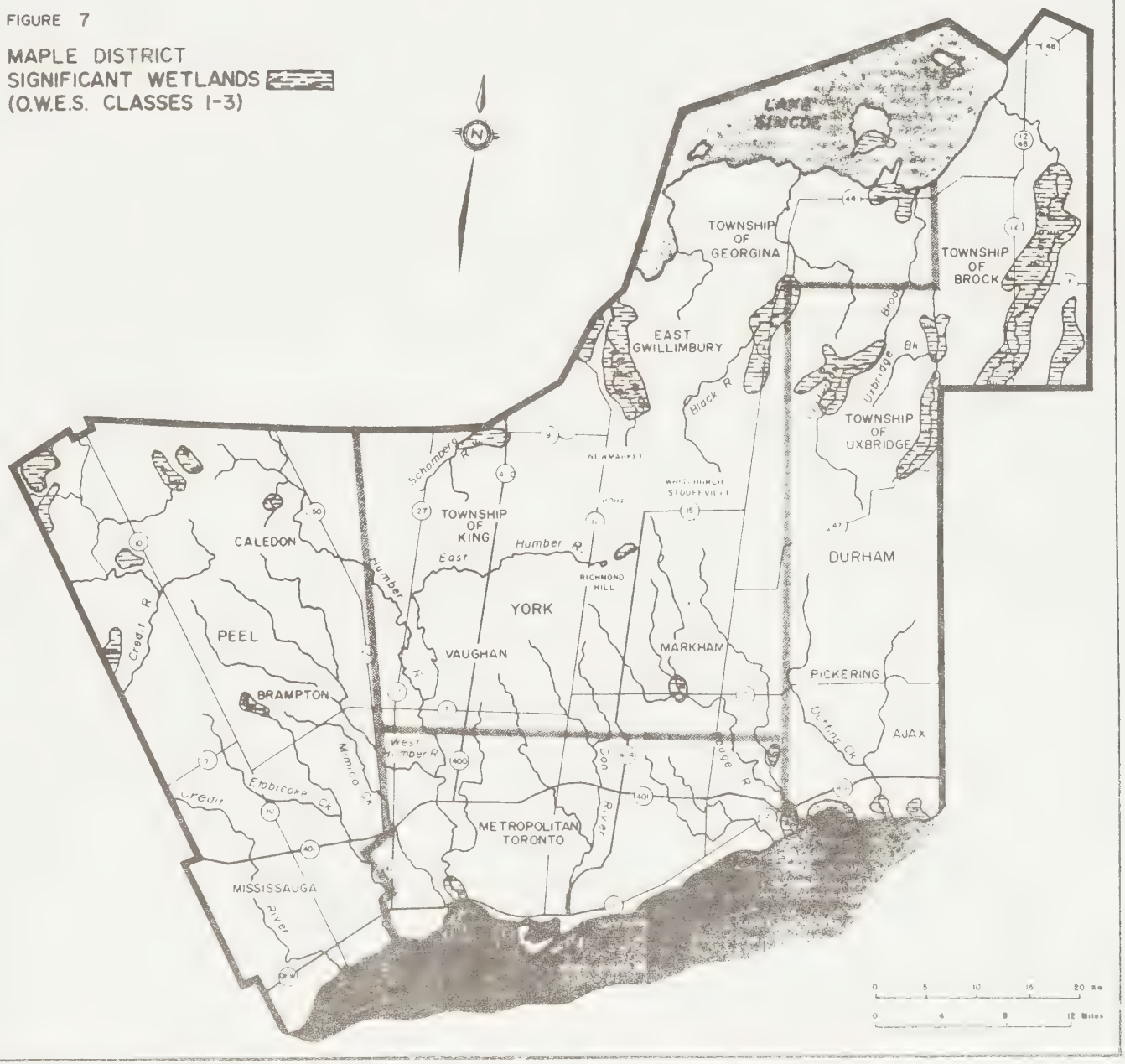


TABLE 1. SUMMARY OF FISHERIES RESOURCES INVENTORY FOR INLAND WATERS OF MAPLE DISTRICT, EXCLUDING LAKES SIMCOE AND ONTARIO.

Waterbody	Total Area (ha)	Total Estimated Potential Yield: Mean kg/ha/yr	Total Estimated Potential Yield: Total[1] kg/yr
Coldwater Lakes with public access	61.0	10.4	552
Warmwater Lakes with public access	236.2	14.6	2,976
Private Warmwater Lakes	148.2	—	(1,356[2])
Coldwater Streams[3]	136.0		
All species		6.1[5]	830
Baitfish[4]		4.6	626
Warmwater Streams[3] (>10m width)	550.7		
All species		30.0[6]	16,521
Baitfish[4]		27.0	14,869
Warmwater Streams[3] (<10m width)	160.7		
Baitfish[4]		27.0	4,339
Credit River			
Coldwater	83.5		
All species		6.1[5]	509
Baitfish[4]		4.6	384
Warmwater	104.2		
All species		30.0[6]	3,135
Baitfish[4]		27.0	2,813
TOTAL		All species	28,862
		Baitfish	23,031

1 Sum of yields for individual waterbodies
2 The estimated yield from private lakes is not included in the total, since these lakes do not contribute to the public fisheries of Maple District.
3 exclusive of Credit River
4 Baitfish yields estimated at 27 kg/ha/yr for warmwater streams (Portt 1981) and 4.6 kg/ha/yr for coldwater streams (DesJardine 1978)
5 Average salmonid yield estimated at 6.1 kg/ha/yr
6 Average warmwater species yields estimated at 30 kg/ha/yr

TABLE 2. ESTIMATED POTENTIAL YIELD OF SPORT FISH SPECIES AND SPECIES GROUPS FOR INLAND LAKES AND STREAMS, EXCLUDING LAKE SIMCOE AND LAKE ONTARIO, 1986. LAKES DESIGNATED AS L, STREAMS AS S

Species Group		No. of Waterbodies	Total Known Water Area Available to Species(ha)	Total Estimated Potential Yield (kg/yr)
Brook Trout	L	3	44.1	110.1
	S	35	213.1	892.8
Brown Trout	S	7	88.3	429.1
Rainbow Trout	S	2	3.6	14.1
Walleye	S	3	162.9	73.4
Northern Pike	L	2	65.8	177.6
Muskellunge	S	4	172.5	7.7
Smallmouth Bass	L	8	187.3	375.8
Largemouth Bass	S	8	372.2	253.8
Yellow Perch	L	3	68.5	112.6
	S	8	369.8	178.1
Panfish	L	10	233.5	518.1
	S	12	654.1	2,734.6
Coarse fish	L	11	233.5	458.0
	S	13	654.1	16,305.6
TOTAL YIELD				22,641.4

TABLE 3. POTENTIAL YIELD OF SPORT FISH SPECIES IN LAKE SIMCOE

Sport Fish Species	Total Water Area (ha)	1985 Yield (kg)	Total Estimated Potential Yield (kg/ha)	(kg/yr)	Percent of Total
Lake Trout	72,500	29,447	1.048	75,967	23.6
Lake Whitefish		23,391	0.830	60,194	18.7
Lake Herring		5,172	0.182	13,200	4.1
Rainbow Smelt		5,290	0.186	13,520	4.2
Pike		10,212	0.364	26,396	8.2
Walleye		565	0.022	1,610	0.5
Smallmouth Bass		17,658	0.626	45,388	14.1
Yellow Perch		33,179	1.181	85,625	26.6
TOTALS		124,914	4.439	321,900	100.0
Carp		805		9,072*	
Baitfish		39,821		39,870**	

* The total potential yield for carp, quota of 9,072 kg, is based upon historical use.

** The potential yield for baitfish is based on the average baitfish harvest in Maple District baitfish area 13 (Lake Simcoe) plus emerald shiner harvest in Maple areas 10, 11 and 12 and Huronia areas 10, 16, 19, 20 and 21, from 1979 to 1984.

2.3 Current and Projected Resource Use

Most of the recreational angling in Maple District (98%) is done by residents of Ontario. Most of the recreational angling in Maple District takes place on Lake Simcoe, Lake Ontario and the Credit River. Other users of the resource include 67 commercial baitfish fishermen and 2 commercial food-fish fishermen. Non-consumptive activities, such as fish viewing, are also recognized as being important.

Increases in use of the fisheries, to the year 2000, are based on expected increases in human population in Maple District. No attempt has been made to quantify the increases in demand anticipated due to enhanced angler awareness or provision of additional fishing opportunities. The population of the Lake Ontario watershed in Maple District is expected to increase by 23% by 2000, and that of the Lake Simcoe watershed by 43%. In the following sections, demand and production estimates for the Maple District portion of Lake Ontario and Lake Simcoe are used. To develop district targets for Lake Simcoe, which is managed jointly by Maple and Huronia districts, the target testing process was done on a lake basis and current use, projected use, potential yield and target numbers for the whole lake were divided in half to obtain the district values. There is some doubt as to the accuracy of the district targets developed with this method. The Lake Simcoe Management Committee will work closely with the Lake Simcoe Fisheries Assessment Unit and both districts to refine these targets over the next five years.

Table 4 summarizes estimates of current and projected use, and potential yield for the various fisheries in Maple District. These estimates are based on creel surveys from Lake Simcoe, Lake Ontario, the Credit River and waters within Metropolitan Toronto. Angling effort for sportfish is now about 172,642 angler-days/yr; this is expected to increase to 231,161 angler-days/yr by the year 2000. Commercial baitfish harvest is currently averages about 1.39 millon dozen/yr. This is expected to increase to 1.98 millon dozen/yr by the year 2000. Commercial food-fish harvest is expected to remain at current quotas of 9,190 kg/yr.

2.4 Present Management Practices

Maple District fisheries management includes fish population management, habitat rehabilitation and protection, public services, extension and education programs, enforcement and planning. Current management programs (1983-1987) are summarized in Appendix 3.

Fish population management in Maple District involves put-and-delayed-take stocking and rehabilitation stocking programs, localized fish transfers, harvest control and baitfish management. Species stocked for the put-and-delayed-take program in the western basin of Lake Ontario are coho salmon, chinook salmon, brown trout and rainbow trout. Coho and chinook salmon are raised at the Ringwood Fish Culture Station in Maple District. The four species stocked for population rehabilitation are lake trout in Lakes Simcoe and Ontario, lake whitefish in Lake Simcoe, Atlantic Salmon in Lake Ontario, and brook trout in Bogart Creek on the Holland River and the Altona tributary of Duffins Creek. In 1984 a fish transfer program was initiated to encourage development of a spawning walleye population in Pefferlaw Brook. The experimental re-introduction of Atlantic salmon into the Credit River was initiated in 1988.

TABLE 4. COMPARISON (TARGET TESTING) OF PRESENT RESOURCE USE LEVELS WITH PROJECTED USE AND POTENTIAL YIELD, FOR THE YEAR 2000[1]
NA = estimate not available

	Current Use	DLUG Targets (OMNR 1983)	Projected Use	Potential Yield (Resource-based opportunities)	Final Target
Commercial Fishery					
Baitfish: (doz/yr)					
Lake Simcoe	1,315,710		1,886,742	1,?15,710	1,315,710
Streams (1979-86)	76,741		94,391	224,321	168,240
Baitfish Total	1,392,451	1,890,000	1,981,133	1,540,031	1,483,950
Baitfish: (kg/yr)	27,841	41,182	38,278	42,966	37,208
Food Fish: (kg/yr)[3]	3,919	2,700	9,190	9,190	9,190
Commercial Fishery Subtotal (kg/yr)	31,760	43,882	47,468	52,156	46,398
Sport Fishery					
District (angler-days/yr)		1.6 million			
Lake Simcoe: (kg/yr)	62,457		89,564	160,950	89,564
(angler-days/yr)	92,612		132,805	238,656	132,805
Lake Ontario: (kg/yr)	125,761		154,561	509,000	157,790[5]
(angler-days/yr)	62,881		77,281	254,500	78,895
Inland Lakes:					
Coldwater(kg/yr)	NA		NA	552	552
(angler-days/yr)	NA		NA	2,760	2,760
Warmwater(kg/yr)[6]	1,465		1,800	2,976	2,976
(angler-days/yr)	2,930		3,601	5,952	5,952
Rivers:[7]					
Coldwater(kg/yr)	NA		NA	329	329
(angler-days/yr)	NA		NA	1,645	1,645
Warmwater(kg/yr)[6]	741		911	1,963	1,963
(angler-days/yr)	1,481		1,820	3,926	3,926
Upper Credit R.[8]					
(kg/yr)	2,548		3,131	511	511
(angler-days/yr)	12,738		15,654	2,555	12,738
Sport Fishery Subtotal (kg/yr)	192,972		249,967	676,281	253,685
(angler-days/yr)	172,642	1.6 million	231,161	509,994	238,721
TOTAL (kg/yr)	224,732		297,435	728,437	300,083

1 Where creel data were not available, the estimate of angler-days was based on harvest estimates of 0.2 kg per angler day for coldwater species, or 0.5 kg per angler day for warmwater species. Where both coldwater and warmwater fishes exist in the same water body, the relative proportions of harvest were taken into consideration
2 Commercial harvest target is 75% of potential yield
3 Commercial fish quotas for Lakes Ontario and Simcoe based on recent harvest
4 Does not include baitfish portion of total potential yield
5 Potential salmonid harvest (31% of total potential yield; estimate of angler-days assumes a harvest estimate of 2 kg/day)
6 Creel data from MIROA (1986) for urban areas of Metropolitan Toronto
7 Rivers of Maple District excluding the upper Credit River; much of the "baitfish" production in these rivers (i.e. white suckers, creek chub) is available to recreational anglers
8 Estimates for coldwater fisheries above Cheltenham, only

A cooperative sea lamprey control program is carried out by Maple District and the Sea Lamprey Control Centre of the Federal Department of Fisheries and Oceans. Chemical treatments are used to kill ammocoetes in river systems and barriers are constructed to prevent upstream migration from Lake Ontario to suitable spawning habitat by adult sea lamprey

Harvest control measures for sportfish include the designation of fish sanctuaries and size/season limits. Fish sanctuaries are located on the Black River, Beaverton River, Pefferlaw Brook and the Talbot River, to protect spawning smallmouth bass; sanctuaries on the Credit River have been established primarily to protect private property from unethical anglers during the Pacific salmon spawning runs.

Baitfish harvest in Maple District is managed by controlling the number of baitfish harvest licences issued in each of the 13 baitfish management units (Fig. 8). Private aquaculture of baitfish is being encouraged.

Maple District and the three conservation authorities in its jurisdiction, Credit Valley Conservation Authority (CVCA), Metropolitan Toronto and Region Conservation Authority (MTRCA) and Lake Simcoe and Region Conservation Authority (LSRCA), conduct stream rehabilitation work throughout the District to improve fish habitat, control erosion and improve water quality. Funding is supplied in part from OMNR Fisheries Rehabilitation monies. Other recent projects include the installation of a modular fiber glass fishway to enable smallmouth bass to bypass the Pefferlaw Town dam, construction of a sea lamprey barrier on the Credit River at Streetsville, and a Community Fisheries Involvement Program (CFIP) project to improve pike spawning habitat in Lake Wilcox.

Fisheries information is presented to the general public using both active and passive methods. Active methods are meant to increase public awareness of the fisheries resource, its habitat and management. Public awareness is achieved through use of displays at public exhibitions, distribution of fisheries brochures, presentations to school groups, media interviews, OMNR news releases, education packages such as the Resource Kit, and special events like Metro Fishing Week. Passive extension work involves responses by fish and wildlife staff to individual inquiries from the public.

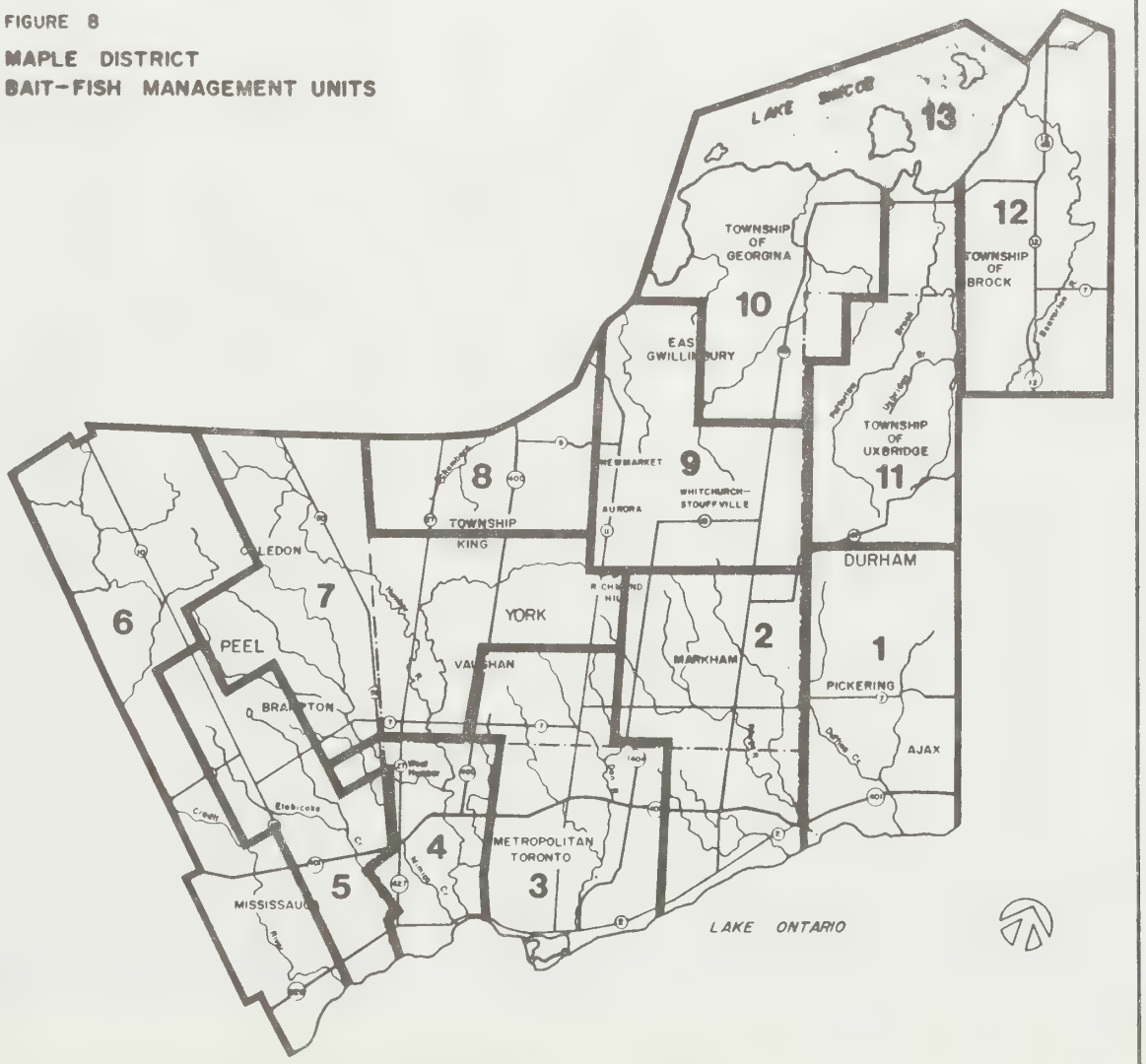
The enforcement program is a major component of fisheries management. It includes enforcement of regulations associated with harvest controls (e.g., seasons, catch limits, etc.) and habitat protection. Habitat protection which includes monitoring of projects to ensure compliance with the conditions of MNR permits and approvals is becoming increasingly important as development pressures increase. To assist in coordinating enforcement activities, districts will develop enforcement plans to help guide the enforcement program.

Fisheries regulations are enforced by seven Conservation Officers and 19 Deputy Conservation Officers. Work related to enforcement, management, administration and extension aspects of fisheries accounted for about 46% of the conservation officer's total workload. One of the seven regular officers is directly responsible for commercial fisheries, and monitors Ontario fishing quotas through the large fish market in the Toronto area.

Fisheries planning in Maple District includes the development of plans for fisheries and protection of fish habitat through plan input and review of municipal planning documents under the jurisdiction of the Planning Act. By means of this plan input process, Ministry programs can identify concerns

FIGURE 8

MAPLE DISTRICT
BAIT-FISH MANAGEMENT UNITS



LEGEND

NUMBERS REFER TO MANAGEMENT AREAS OUTLINED IN TEXT

SCALE

and constraints to municipalities when development is first being considered for an area. If concerns are not addressed at the input stage, the ability to achieve fisheries objectives is reduced. The interrelationship of Official Plan policies, stormwater master drainage plans and specific subdivision plans requires that each, in turn, must address Ministry concerns. Failure to expend time at the beginning of the planning process and to maintain consistency leads to omission of concerns or confrontations at various points (planning committee meetings, Council or the Ontario Municipal Board).

The protection of the fisheries resource can utilize a variety of tools to achieve the Ministry's mandate. These tools include:

a) use of vegetative buffers adjacent to watercourses as outlined in the "Guidelines on the Use of Vegetative Buffer Zones to Protect Fish Habitat in an Urban Environment" (OMNR, 1987)

b) minimization of sediment movement off the development site

c) no flushing of stormwater systems in a development until accumulated sediments from construction activities have been removed and the area has been vegetated

d) zoning of protective strips along side of streams thus preventing development activities

e) refusal to allow channelization of streams

f) design of flood related structures to ensure fish movement, and to maintain base flow and water quality characteristics that support fisheries

g) treatment of stormwater to provide reductions in peak flows, sediment and pollutant concentrations.

While not an exclusive list, the applicability of any protective measure must relate to the specific site characteristics and the impacts on the fishery resource.

Planners, engineers, biologists and managers at OMNR also participate in other planning exercises. These include environmental assessment proceedings, watershed management plans coordinated by the Conservation Authorities (eg. the Rouge River Watershed Management Plan) and the Remedial Action Plan (RAP) for the Toronto waterfront.

Appendix 4 provides a summary of legislation relevant to fisheries and fish habitat in Ontario.

2.5 Problems and Issues

Fisheries managers in Maple District face a number of challenges, which may be classified broadly as: **threats to water quality and fish habitat, threats to fish populations, limited access to fishing areas, scientific information needs** and need for **public education** regarding protection and use of fisheries resources.

Threats to water quality and fish habitat arise from land or water uses incompatible with healthy aquatic ecosystems. In Maple District these uses

are generally associated with agriculture or urban development, and may include forest clearing, erosion, nutrient enrichment, stormwater runoff, channelization or toxic spills. In some cases mitigative measures may be taken to protect sensitive fisheries; in others, economic pressures may prevent effective protection. Development scenarios for the Humber, Don and Rouge River watersheds, for example, predict extensive areas of new urban and industrial development in the next 40 years. As conventionally practiced, land development and urbanization result in the rapid degradation, isolation and burial of natural stream corridors and fish habitat, and the gradual degradation of entire watersheds. Warmwater streams in the Toronto area are most affected at present, but cold headwater streams that originate in the Oak Ridges Moraine are also threatened by deforestation, channelization and stormwater runoff from built-up areas.

Eutrophication or "fertilization" of Lake Simcoe has contributed to the decline of the coldwater fishery. Nutrients from agricultural runoff, sewage treatment plants and urban runoff fertilize algal growth in the lake. When the algae die each year and decompose on the bottom of the lake, dissolved oxygen in the deep, cold waters (hypolimnion) is consumed. Low oxygen levels in the hypolimnion restrict the amount of habitat available to lake trout, lake whitefish and lake herring, and reduce their ability to grow and reproduce.

A thriving aquaculture industry exists in Maple District. Although this industry may cause some degradation of water quality if effluent is not properly treated, aquaculture does provide many benefits. These include fish for food and fish for provincial fishing areas and private fishing ponds which relieve the pressure on the limited supply of natural fish.

Contamination of aquatic ecosystems can result in the loss of fishing opportunities through degradation of fish habitat and through some anglers' reluctance to catch and keep contaminated fish. Urban and industrial areas are a major source of toxic metals and persistent organic contaminants from accidental spills, storm runoff, illegal dumping of hazardous waste and sewage treatment plant effluent. Application of pesticides and herbicides on agricultural and residential land contributes persistent organic contaminants to groundwater and streams in the Lake Simcoe and Lake Ontario watersheds.

Fisheries may be managed on the basis of discrete sub-populations or stocks, which, in many instances, have adapted to the conditions of a specific habitat. Over-harvest occurs when the demands of resource users exceed the productive capacity of a fish stock. Demands on the resource may come from anglers, commercial fishermen, native fisheries or illegal harvest. The loss or depletion of a fish stock through over-harvest results in direct loss of fishing opportunities for that species, and may also reduce production of other species by disrupting the aquatic community. Over-exploitation may cause the depletion or complete collapse of fish stocks. In such cases as the Lake Simcoe coldwater fishery, over-harvest can impair or delay attempts to rehabilitate the fishery.

Although there is not presently a native fishery in Maple District, OMNR is negotiating with native people to clarify the recognition of native fishing rights.

Introductions of non-native species such as Pacific salmon, rainbow trout, brown trout, alewife, white bass, white perch, rainbow smelt and carp, and of native species such as northern pike and yellow perch, have greatly

influenced the fish communities of Maple District waters. Sea lamprey control remains a concern in Lake Ontario. Introductions of carp, northern pike and rainbow smelt have likely contributed to the decline of muskellunge and lake whitefish in Lake Simcoe.

Periodic fish kills occur throughout Maple District as a result of toxic discharges into lakes, streams and storm sewers. Some loss of fish (predominantly forage species such as alewife) occurs through entrainment or impingement via the cooling water intakes at the Pickering Nuclear Generating Station. Dams and associated impoundments, including small-scale hydro-electric or "micro-hydro" installations, have the potential to block or kill migrating fishes, and to impair reproduction, rearing and feeding of resident fishes.

Access to lakes, rivers and ponds in Maple District is perceived as a major constraint for anglers. Most of the land in the District is privately owned, and public facilities for boat launching, fishing piers and stream access are few in number and often intensively used at certain times of the year. Studies into this problem in Maple District have indicated that land purchase and cooperative access agreements with landowners are key solutions to this growing problem.

Information needs for fisheries management may be of a scientific nature, for example better estimates of fish production and habitat requirements are needed, or of a social nature, for example data about preferences, attitudes and habits of anglers. Economic understanding of Ontario fisheries, especially recreational fisheries, is inadequate. Decisions about allocation of the resource must often be made without adequate knowledge of the potential economic benefits. Understanding of economic principles, and a system for providing basic economic data would greatly assist in defining interrelationships between alternative uses. Economic studies are required to understand market structures and to predict future recreational and commercial requirements. Fisheries problems also require research in the field of the social sciences, in areas of cultural and behavioural conflicts, and in defining wants and needs of recreational anglers.

Public education may prove to be one of the most effective tools of fisheries management in an area such as Maple District. When directed at young people it represents an investment in the future of wise resource management. When directed at adult anglers, municipalities, developers and agricultural organizations it has the potential for immediate improvements in integrated resource management.

3.0 MANAGEMENT DIRECTION

3.1 General Fisheries Management Objectives

The fisheries management goal of the Ministry of Natural Resources is "to protect, rehabilitate, enhance and maintain fish communities and their environment, to provide an optimum contribution of fish, fishing opportunities and associated social and economic benefits to the people of Ontario". General guiding principles for fisheries management in Maple District are as follows:

- to provide an optimum contribution of fish, fishing opportunities and associated benefits to meet such social needs as wholesome food, recreation, employment and income, and a healthy human

environment;

- to promote an aquatic environment capable of supporting healthy fish communities by protecting and maintaining fish habitat, and by encouraging resource uses compatible with healthy aquatic ecosystems;

- to protect the fishery resource through effective enforcement of regulations;

- to achieve "no net loss" of fisheries habitat (Appendix 6) in the face of changing land use;

- to rehabilitate degraded fish communities and fish habitat, for self-sustaining, native stocks;

- to develop a greater knowledge of fish populations, fish habitat and aquatic ecosystems; to foster science suited to the needs of aquatic resource management in Ontario;

- to promote public awareness, appreciation and understanding of fisheries resources and the aquatic habitats on which they depend, i.e. to show the linkages between healthy human environments and healthy aquatic ecosystems; and

- to involve organized angler associations, environmental interest groups and the general public in fisheries management activities.

Specific objectives for Maple District, based in part on the DLUG report, are as follows:

Sport Fishing
- to provide opportunities for recreation, within the limits of a wisely managed and rehabilitated resource

Commercial Fishing
- to provide opportunities for employment by maintaining a viable industry at current quota levels

Baitfish Fishing
- to provide opportunities for employment, within the limits of a wisely managed resource

Non-consumptive Uses
- to provide opportunities for enjoyment of a healthy aquatic ecosystem

Provincially Rare, Threatened and Endangered Species
- to prevent the extinction of any native fish species

3.2 Strategies, Tactics and Targets

Management strategies are policies that will be adopted to meet the objectives and uphold the principles of habitat protection and rehabilitation, fish production, fishing opportunities, angler access or public education, as outlined above. These strategies are prepared with

reference to current and predicted land use, population trends, fish production capabilities and user demands in Maple District. Management tactics are specific actions that will be taken to implement these strategies. A target is a quantified level of fisheries use or production used to measure progress towards meeting an objective. A target can also be considered in qualitative terms, such as attaining rehabilitated fisheries habitat.

In this plan, fisheries management targets and strategies and tactics have been refined, based on public input, from those outlined in the Background Information Summary, Strategies and Tactics for Maple District Fisheries (OMNR 1987c) and those in the Maple District Fisheries Management Plan, Draft (OMNR 1988).

To allow management tactics to be further tailored to the specific needs of different waters and different fisheries, **management zones** within Maple District have been identified. Most management zones in Maple District are based on watersheds of river systems or large lakes, e.g. Duffins Creek or Lake Simcoe. A management zone may be divided into subzones, as on the Credit River, Humber River and Lake Simcoe basin, to recognize distinct management needs for coldwater, migratory and warmwater fisheries within a watershed. The 8 management zones in Maple District are:

1. Credit River (with 3 subzones)
2. Humber River (with 2 subzones)
3. Small Peel Plain Rivers
4. Rouge River
5. Duffins Creek
6. Lake Simcoe Zone (with 2 subzones)
7. Lake Ontario Zone
8. Inland Lakes and Ponds Zone

General, or district-wide strategies and tactics for fisheries management in Maple District are specified in Sections 3.2.1 - 3.2.5 for the sport fishery, the baitfish fishery, the commercial food-fish fishery, non-consumptive fishery uses, and protection of rare, threatened and endangered species. Where quantitative targets have been established, these are also listed (also refer to Table 4). Appendix 1 provides detailed information about fisheries management activities and projects planned for each management zone. The strategies and tactics identified in the Maple plan for Lake Simcoe are consistent with those presented in the Huronia plan

3.2.1 General Strategies and Tactics for Sport Fisheries

TARGETS

- increase the use of Lake Ontario by 16,014 angler-days/yr
- manage the Lake Simcoe fishery to accommodate an additional 40,194 angler-days/yr
- limit harvest on the upper Credit River resident coldwater fishery to 511 kg/yr, while maintaining or increasing present angling opportunities (present use is 12,738 angler-days/yr)
- increasing angler use on the remainder of District waters, to

achieve an overall District target of 238,721 angler-days/yr, an increase of 40% (66,079 angler-days/yr). Increased use of inland lakes and ponds (excluding Lake Simcoe) and rivers (excluding of the upper Credit River) will provide an important contribution to this target

The Maple District targets for habitat protection and rehabilitation, fish production and angler satisfaction, while providing 66,079 new angler-days/yr, can be met through implementation of the following strategies and tactics.

i) PROTECT FISHERIES HABITAT BY MINIMIZING THE EFFECTS OF DEVELOPMENT, WITH EMPHASIS ON HEADWATERS AND OTHER BIOLOGICALLY SIGNIFICANT HABITAT.

(a) identify sensitive areas, including groundwater sources, spawning and rearing habitats, through inventory and habitat assessment programs

(b) enforce existing legislation pertaining to fish habitat protection

(c) implement the federal Department of Fisheries and Oceans policy for the management of fish habitat, including the principle of **no net loss of fish habitat** (Appendix 6) i.e. strive to balance unavoidable habitat losses with habitat replacement on a project-by-project basis

(d) liaise with conservation authorities and other provincial, federal and international agencies (e.g. Ontario Ministry of the Environment (OMOE), Ontario Ministry of Agriculture and Food (OMAF), Ontario Hydro, Department of the Environment (DOE), Department of Fisheries and Oceans (DFO), International Joint Commission (IJC)) to ensure that sensitive habitat is identified and receives recognition and protection; identify fisheries, where appropriate, as the most sensitive use; continue municipal plan input and review

(e) implement wetland management policy that will protect headwater, riverine and estuarine wetlands; evaluate the fisheries significance of the wetlands in Maple District; consider valuable wetlands in the plan input and review process; inform private landowners about valuable wetlands on or adjacent to their property, and the importance of those wetlands to fisheries and water management

(f) minimize stream bank and shoreline disturbance during development; demarcate and protect natural vegetation during and after construction activities by applying the vegetative buffer zone guidelines presented in Appendix 5

(g) review water management schemes impacting fisheries (e.g. Lake Simcoe water levels, Trent-Severn Waterway levels and flows, hydro power projects, withdrawals for irrigation or industry, groundwater withdrawals)

(h) require erosion and sediment controls during and after construction, including site rehabilitation as soon after construction as possible, to reduce siltation of receiving waters

(i) discourage dredging and channelization when alternate methods of flow management exist; where channelization is unavoidable, natural channel features are to be incorporated, and passage for fish migration provided where appropriate

(j) prohibit direct inflow of untreated stormwater into watercourses; ensure that stormwater treatment and urban runoff controls reflect current technology, e.g. source control of stormwater, retention/detention facilities, landscape design; require that sediment control ponds be designed to detain at least 125 m^3/ha

runoff from the development for at least 12 hours, or be capable of removing particle sizes down to 40 microns (interim guidelines based on a compromise between pond size and cost, and effectiveness of sediment and nutrient removal).

(k) work with municipalities to encourage the maintenance and upkeep of stormwater control structures and stream bank stabilization projects

(l) develop education and extension programs to improve public, corporate and governmental understanding of integrated resource management and the "ecosystem" approach to fisheries protection and rehabilitation; ensure recognition of the biological and socio-economic benefits of healthy fisheries

(m) approach municipalities regarding preparation of official plan amendments and zoning bylaws that afford protection to fisheries resources

(n) prohibit the construction of onstream ponds

ii) REHABILITATE DEGRADED FISH HABITAT, WITH AN EMPHASIS ON LAKE SIMCOE, LAKE ONTARIO AND SENSITIVE COLDWATER SYSTEMS ALONG THE OAK RIDGES MORAINE; REHABILITATE WARMWATER FISHERIES IN DEGRADED URBAN AND AGRICULTURAL STREAMS

(a) maintain established cooperative rehabilitation projects, and encourage new projects with conservation authority municipalities, local angler clubs, interest groups, scientific associations and universities, individual landowners and other government agencies (e.g. OMAF, OMOE)

(b) establish a priority system for habitat rehabilitation projects on lakes and watersheds

(c) continue lake and stream rehabilitation programs to improve degraded fish habitat, with emphasis on headwater areas of streams and lakes of local and provincial significance (e.g. Lake Simcoe, Lake Ontario); continue to develop practical expertise in habitat rehabilitation, including that for large rivers

(d) remove undesirable barriers to fish migration while maintaining sea lamprey control; prevent the construction of new dams; encourage conversion of existing dams to bottom-draw discharge; consider modification of barriers to allow fish passage, if appropriate

iii) PROTECT EXISTING FISH STOCKS DURING VULNERABLE PERIODS SUCH AS MIGRATION, SPAWNING AND NURSERY STAGES

(a) identify migration corridors, spawning areas and nursery habitats

(b) enforce existing fishing regulations; continue to identify and implement new measures required to protect fish populations; continue to evaluate the effectiveness of existing fish

sanctuaries and designate additional sanctuaries if clearly required

(c) direct the timing of development activities in and around water; instream or lakeshore work permitted according to the guidelines presented in Appendix 7 and figure 9

(d) ensure adherence to mitigation techniques during construction

(e) monitor and implement improvements in mitigation techniques on construction sites, i.e. apply best practicable technology

iv) PARTITION MIGRATORY FROM RESIDENT POPULATIONS IN SPAWNING AND/OR NURSERY STREAMS AND RIVERS, TO PREVENT OR MINIMIZE INTERSPECIFIC COMPETITION AND TO ENHANCE PRODUCTIVITY

(a) use existing dams and obstructions as barriers where required; employ fishways to selectively facilitate or restrict upstream access

(b) construct weirs or barriers to selectively restrict or facilitate fish migrations

v) MAINTAIN THE GENETIC INTEGRITY OF EXISTING FISH POPULATIONS

(a) identify key fish stocks by electrophoretic studies and tagging programs

(b) identify measures to protect key fish stocks, e.g. refuge lakes

(c) prevent the introduction of wild, domesticated and non-native fish stocks which would have a negative impact on native or naturalized fish populations

vi) CONTROL EXPLOITATION RATES TO PREVENT OVER-HARVESTING OF FISH STOCKS

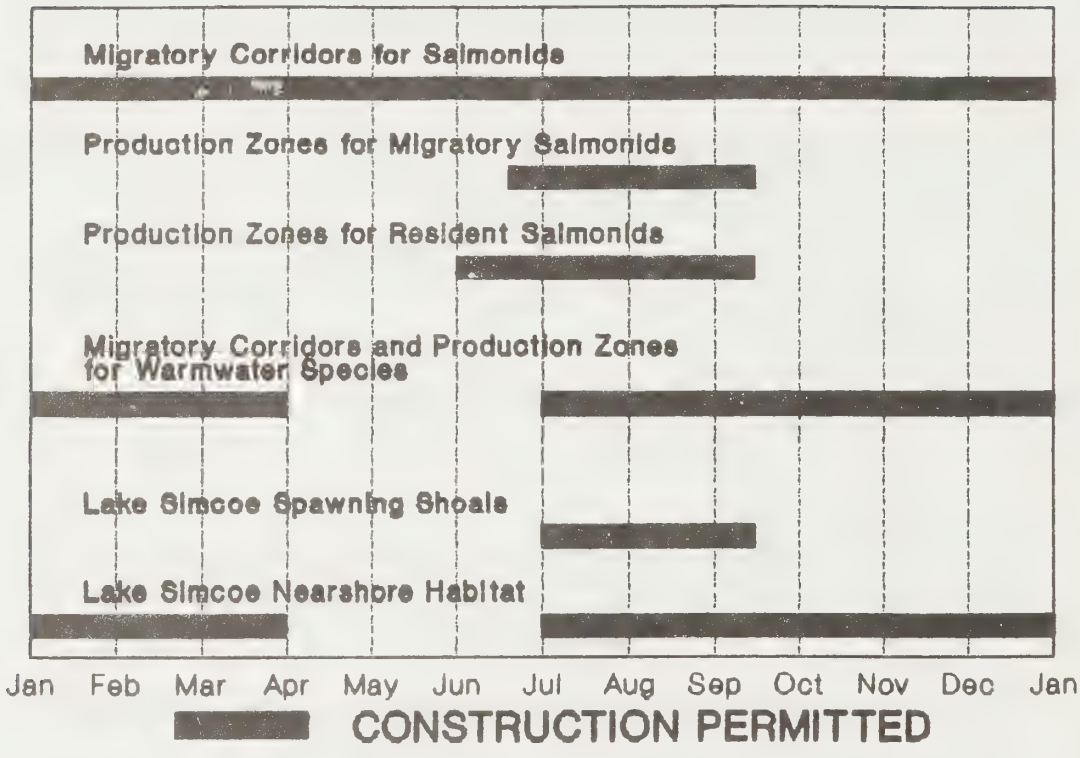
(a) Continue to enforce existing creel limits and fishing seasons; investigate need for more enforcement personnel; prioritize enforcement effort

(b) increase public awareness and appreciation of special fisheries regulations

(c) evaluate the need for proposed and existing regulations based on biological merit and social, economic and ethical concerns; implement these as required (e.g. fly fishing only, special size limits, catch-and-release, gear and bait restrictions)

(d) redirect fishing effort to under-utilized waters and species

FIGURE 9: CONSTRUCTION TIMING GUIDELINES



vii) IMPROVE PUBLIC ACCESS TO INLAND AND GREAT LAKES FISHERIES

(a) develop an extension program involving private landowners, angler organizations and municipalities to improve angler awareness, enhance fishing access, and foster working relations amongst these groups; prepare a brochure, with map, outlining angling access in Maple District

(b) support land easements and other negotiated agreements with private landowners

(c) encourage individuals, organized user groups and municipalities to provide fishing access, or develop new public access points and facilities, through financial incentives and cost-sharing programs

(d) promote awareness of urban fishing opportunities

(e) encourage land acquisition programs of other agencies (e.g. Conservation Authorities) when fisheries will be a primary beneficiary

viii) SUPPLEMENT SELECTED FISH POPULATIONS WITH PLANTINGS OF HEALTHY FISH ACCORDING TO PROVINCIAL STANDARDS AND PROCEDURES

(a) continue plantings of hatchery reared fish; review fish stocking targets regularly; recognize limits to stocking imposed by availability of forage fish

(b) ensure that hatchery fish of the appropriate size are distributed to good quality stocking sites during times when survival will be maximized

(c) use adult fish transfers where feasible to augment depleted populations or to facilitate range expansion

(d) investigate the applicability of artificial rearing techniques and mini-hatchery projects initiated under CFIP

ix) CONSIDER THE INTRODUCTION OF ADDITIONAL OR ALTERNATIVE FISH SPECIES WHERE SUCH AN INTRODUCTION WOULD NOT HAVE A SERIOUS IMPACT ON THE EXISTING DESIRABLE FISH POPULATION

(a) continue to investigate the feasibility of re-introducing species such as Atlantic Salmon into selected tributaries of Lake Ontario on an experimental basis

(b) investigate introductions of fish for urban fisheries, e.g. bullheads, northern pike, bass

x) ENCOURAGE THE HARVEST OF UNDER-UTILIZED SPECIES

(a) increase public awareness of under-utilized fish species such as

bullhead, carp, sucker and pumpkinseed through an active education and promotional program, particularly in urban areas

xi) IMPROVE FISHERIES IN SUITABLE BUT UNDER-UTILIZED HABITAT

(a) assess the need for stocking

(b) consider the removal of barriers to fish colonization

(c) investigate the introduction of walleye, largemouth bass, smallmouth bass or northern pike into under-producing or urban waters not presently supporting a top predator species

xii) PROVIDE FISHING OPPORTUNITIES BY CREATING ARTIFICIAL "PUT AND TAKE" FISHERIES IN SELECTED WATERS TO SATISFY DEMAND OR DIVERT PRESSURE FROM RESIDENT FISH STOCKS

(a) investigate need for put-and-take urban fisheries

(b) purchase disease-free fish from private hatcheries, to plant in public waters

(c) encourage the private sector to provide artificial fisheries on a "user pays" basis on private lakes and ponds

xiii) ENCOURAGE PUBLIC PARTICIPATION IN THE MANAGEMENT OF LOCAL FISHERIES

(a) solicit public input and review of major management initiatives

(b) maintain cooperative rehabilitation projects with conservation authorities, municipalities, associations and other government agencies (e.g. OMAF, OMOE)

(c) encourage cooperative projects with local angler clubs, interest groups and individual landowners

xiv) DEVELOP A COMPREHENSIVE FISHERIES ASSESSMENT PROGRAM TO MONITOR FISH POPULATIONS AND HABITAT CONDITIONS

(a) develop an index program to monitor the status of local fish populations; conduct long-term studies on juvenile salmonids; evaluate growth and survival of stocked fish; use tagging to study movement of migratory salmonids; refine potential yield estimates to ensure targets are reasonable

(b) initiate aquatic habitat inventory (survey and habitat assessment components) on unsurveyed waters and waters subject to rapid land use changes; resurvey as required.

(c) develop and maintain creel survey programs to monitor demand and exploitation rates

(d) support, at the district level, the long-term studies of the Fisheries Assessment Units (under the direction of their Management Committees) to ensure that fisheries management needs are met

(e) evaluate the impact of migratory fish on resident fish populations

(f) evaluate the social, economic and biological impacts of fishing derbies and tournaments

(g) use results from specific fish community studies to direct fisheries management of similar communities

3.2.2 General Strategies and Tactics for Baitfish Fisheries

TARGETS

- maintaining baitfish harvest from Lake Simcoe at the present level of 1,315,710 dozen

- increasing stream baitfish harvest from 76,741 dozen to 168,240 dozen or 119%

i) PROTECT AND MAINTAIN EXISTING BAITFISH POPULATIONS

(a) monitor trends in baitfish harvest through annual returns from commercial baitfish fishermen, and compare with current models for potential yield (Table 1) to ensure that local fish populations in heavily fished areas are not over-exploited

(b) prevent over-harvest of baitfish populations by limiting entry to the fishery and restricting harvest where necessary, based on the results of monitoring (see Tactic (a) above) i.e. control number of catch licences allowed in each baitfish management unit; adjust harvest by re-directing effort from over to under-utilized waters

(c) continue to enforce existing regulations pertinent to the capture and sale of baitfish species, including those to prevent the introduction of competitive fish species and the spread of disease; inform baitfish dealers of regulations pertaining to their operations; develop a communication package to educate anglers about regulations pertaining to the harvest of baitfish for personal use

(d) prevent any baitfish species from local extinction, by controlling harvest and preventing habitat loss; exclude baitfish harvest from areas inhabited by rare species, e.g. redside dace; advise baitfish fishermen about the status and distribution of rare, threatened or endangered species

(e) develop education and extension programs as part of an integrated resource management approach to baitfish protection and rehabilitation

ii) INCREASE THE AVAILABILITY OF BAITFISH TO ANGLERS

(a) encourage the private aquaculture industry and baitfish fishermen to rear baitfish species (e.g. common white sucker) to reduce demand on natural populations; provide technical advice and assistance; refer proponents to MOE for approval to remove and discharge water under the Ontario Water Resources Act

(b) consider the introduction of suitable baitfish species to suitable waters

(c) encourage local use of baitfish harvested in Maple District

iii) DEVELOP A COMPREHENSIVE BAITFISH ASSESSMENT PROGRAM

(a) develop methodology for acquiring data on fishing effort by fishermen

(b) evaluate the potential for habitat improvement to increase baitfish yield of streams

(c) determine productivity and potential baitfish yields for local waters; conduct assessment studies of representative waters once every five years

(d) identify critical areas of baitfish habitat, in conjunction with other fish habitat mapping studies

iv) DEVELOP A COMPREHENSIVE BAITFISH MANAGEMENT PROGRAM

(a) encourage baitfish dealers to submit accurate, detailed record of harvest and other licenced activities; consider use of incentives, workshops; streamline administrative procedures

(b) maintain waiting lists for baitfish harvest licences, re-allocate licences that have been inactive for two years to people on the waiting list

(c) re-organize baitfish management areas in Maple District to isolate the Lake Simcoe unit (unit 13); it currently overlaps with river mouths included in units 10, 11 and 12 (Fig. 8)

(d) encourage the establishment of a Maple District baitfish management council comprised of commercial baitfish fishermen

(e) investigate the implementation of the "exclusive-use block system" as the standard means of sharing baitfish among harvesters

3.2.3 General Strategies and Tactics for Commercial Food-fish Fisheries

TARGETS

- limit commercial food-fish harvest to a maximum of 9,190 kg/yr (Lake Simcoe- carp; Lake Ontario- carp, catfish, 45 kg round whitefish, 14 kg common white sucker, 14 kg white bass, 45 kg yellow perch)

i) LIMIT THE PRESENT LEVEL OF COMMERCIAL FISHING TO THE EXISTING LICENCES IN MAPLE DISTRICT

(a) monitor harvest on an annual basis

ii) MAINTAIN VIABLE COMMERCIAL FISHERIES OPERATIONS THAT DO NOT CONFLICT WITH ESTABLISHED OR POTENTIAL RECREATIONAL FISHERIES

(a) when conflicts occur, consideration will be given to purchasing commercial fisheries, restricting harvest or encouraging use of alternate species or type of gear

(b) support fishing practices and techniques that prevent the harvest of non-target species e.g. adoption of live capture gear where practical

iii) ENCOURAGE THE EXISTING COMMERCIAL FISHING INDUSTRY TO SEEK MARKETS FOR NEW AND UNDER-UTILIZED SPECIES THAT COULD SUPPORT COMMERCIAL HARVEST (e.g. burbot, suckers)

iv) SUPPORT THE INFORMATION NEEDS AND ENFORCEMENT REQUIREMENTS OF COMMERCIAL FISH MARKETS IN THE TORONTO AREA, AS PART OF ONTARIO'S MODERNIZATION PROGRAM FOR COMMERCIAL FISHERIES

(a) continue to devote a full time Conservation Officer to provincial commercial fisheries enforcement in Maple District; hire additional staff as necessary

3.2.4 General Strategies and Tactics for Non-consumptive Uses of Fisheries

i) ACTIVELY PROMOTE NON-CONSUMPTIVE USES OF LOCAL AQUATIC RESOURCES

(a) develop extension and education programs e.g. issue news releases to inform the public of upcoming viewing events; prepare and update pamphlets listing and describing viewing opportunities

(b) develop fish viewing events and areas e.g. promote the establishment and preservation of streambank buffer zones for non-consumptive enjoyment of fisheries; install displays to improve public knowledge of the resource; continue to operate and update the interpretive public facilities at Ringwood Fish Culture Station; improve access to fish viewing areas; encourage incorporation of fish viewing facilities in new projects where feasible

3.2.5 General Strategies and Tactics for Protection of Rare, Threatened and Endangered Species

i) PREVENT THE EXTINCTION OF RARE, THREATENED AND ENDANGERED SPECIES

(a) establish the distribution and habitat requirements of these species (e.g. redside dace, Lake Simcoe whitefish stock) in Maple District, through the aquatic habitat inventory program

(b) protect areas inhabited by these species from the impacts of development and fishing

(c) rehabilitate degraded fish habitat

(d) maintain public awareness of rare, threatened and endangered species

(e) augment declining populations where feasible e.g. developed technology for culturing of whitefish to artificially supplement declining Lake Simcoe stock

4.0 Implementation

An implementation schedule for the first five years of the 1989-2000 planning period is outlined in Table 5. Annual work plans addressing details of timing and cost will be developed according to the priorities established in this schedule. Implementation schedules will also be prepared in 1994 and 1999, and will be subject to public review and approval by the Maple District Manager and the Director of Central Region. Five-year schedules are subject to annual review and minor revision; major revision will require public review and re-approval.

Strategies identified in this Plan will be implemented through such mechanisms as:

- programs and projects approved and funded by the OMNR
- input to or participation in other programs carried out by the OMNR, Conservation Authorities, other government agencies and municipalities
- special employment initiatives
- cooperative efforts with local angling clubs and private interest groups under CFIP

The focus in the first five years of the Maple District Fisheries Management Plan is on:

1. preservation and rehabilitation of high-quality fish habitats and stocks along the Oak Ridges Moraine, on the upper Credit River, and on lower reaches of other waters such as the Talbot River; effective plan input and review to mitigate the effects of development on fishery resources;

2. enhancement and rehabilitation of Lake Ontario and Lake Simcoe salmonid stocks, with the long-term aim of establishing self-reproducing populations;

3. promoting awareness of under-utilized fisheries in Maple District, i.e. in urban areas, on warmwater rivers and on inland lakes and ponds; and

4. improving access to fisheries resources in Maple District, through land purchase and agreements with landowners and municipalities.

TABLE 5: IMPLEMENTATION SCHEDULE FOR 1989 TO 1993

Sport Fisheries

	EXISTING FUNDING	ADDITIONAL FUNDING
i) PROTECT FISHERIES HABITAT BY MINIMIZING THE EFFECTS OF DEVELOPMENT, WITH EMPHASIS ON HEADWATERS AND OTHER BIOLOGICALLY SIGNIFICANT HABITAT.		
(a) identify sensitive areas, including groundwater sources, spawning and rearing habitats through inventory and habitat assessment programs	Some work done with help of Conservation Authority staff and sportsmen's groups	Upper Credit River Upper Duffins River Upper Humber River Talbot River
(b) enforce existing legislation pertaining to fish habitat protection	limited enforcement occurs	Consider enforcement position to be responsible for monitoring activities impacting on fish habitat
(c) implement the federal Department of Fisheries and Oceans policy for the management of fish habitat, including the principle of **no net loss of fish habitat** (Appendix 6) i.e. strive to balance unavoidable habitat losses with habitat replacement on a project-by-project basis.	limited implementation	Throughout district
(d) liaise with conservation authorities and other provincial, federal and international agencies (e.g. OMOE, OMAF, Ontario Hydro, DOE, DFO, IJC) to ensure that sensitive habitat is identified and receives recognition and protection; identify fisheries, where appropriate, as the most sensitive use; continue municipal plan input and review	All programs, throughout district	Increase communication with these agencies

(IMPLEMENTATION SCHEDULE CONTINUED)	EXISTING FUNDING	ADDITIONAL FUNDING
(e) implement wetland management policy that will protect headwater, riverine and estuarine wetlands; evaluate the fisheries significance of the wetlands in Maple District; consider valuable wetlands in the plan input and review process; inform private landowners about valuable wetlands on or adjacent to their property, and the importance of those wetlands to fisheries and water management	Protect wetlands through plan input and review; evaluate remaining 10% of the wetlands as funding permits	Evaluate the fisheries significance of the wetlands associated with each watershed, using the Credit River subzone 1 for a pilot study; incorporate information on other wetland attributes such as wildlife, whether it is an Area of Natural and Scientific Interest (ANSI) Identify landowners with wetlands on or near their property; contact landowners and provide information package explaining the importance of their wetland; pending results of pilot study, establish priority for applying a similar approach in other watersheds
(f) minimize stream bank and shoreline disturbance during development; demarcate and protect natural vegetation during and after construction activities by applying the vegetative buffer zone guidelines presented in Appendix 5	Through plan input and review	
(g) review water management schemes impacting fisheries (e.g. Lake Simcoe water levels, Trent-Severn Waterway levels and flows, hydro power projects, withdrawals for irrigation or industry, groundwater withdrawals)	Through plan input and review; draw on expertise from OMOE	
(h) require erosion and sediment controls during and after construction, including site rehabilitation as soon after construction as possible, to reduce siltation of receiving waters	Through plan input and review	Increase compliance monitoring and enforcement

	EXISTING FUNDING	ADDITIONAL FUNDING
(IMPLEMENTATION SCHEDULE CONTINUED)		
(i) discourage dredging and channelization when alternate methods of flow management exist; where channelization is unavoidable, natural channel features are to be incorporated, and passage for fish migration provided where appropriate	Through plan input and review using conditions of the Lakes and Rivers and Improvement Act	
(j) prohibit direct inflow of untreated stormwater into watercourses, ensure that stormwater treatment and urban runoff controls reflect current technology, e.g. source control of stormwater, retention/detention facilities, landscape design; require that sediment control ponds be designed to detain at least 125 m^3/ha runoff from the development for at least 12 hours, or be capable of removing particle sizes down to 40 microns (interim guidelines based on a compromise between pond size and cost, and effectiveness of sediment and nutrient removal)	Through plan input and review and in conjunction with OMOE and Federal Fisheries Act	Develop Mitigation Education Program
(k) work with municipalities to encourage the maintenance and upkeep of stormwater control structures and stream bank stabilization projects	Throughout district	
(l) develop education and extension programs to improve public, corporate and governmental understanding of integrated resource management and the "ecosystem" approach to fisheries protection and rehabilitation; ensure recognition of the biological and socio-economic benefits of healthy fisheries	Promote: Resource Education Kit CFIP Project Wild CWIP	Develop Mitigation Education Program; Hold annual Fisheries Science Day
(m) approach municipalities regarding preparation of official plan amendments and zoning bylaws that afford protection to fisheries resources.	Limited staff time	district wide
(n) prohibit the construction of onstream ponds	Throughout district using Lakes and River Improvement Act	

	EXISTING FUNDING	ADDITIONAL FUNDING
(IMPLEMENTATION SCHEDULE CONTINUED)		
ii) REHABILITATE DEGRADED FISH HABITAT, WITH AN EMPHASIS ON LAKE SIMCOE, LAKE ONTARIO AND SENSITIVE COLDWATER SYSTEMS ALONG THE OAK RIDGES MORAINE; REHABILITATE WARMWATER FISHERIES IN DEGRADED URBAN AND AGRICULTURAL STREAMS		
(a) maintain established cooperative rehabilitation projects, and encourage new projects with conservation authorities municipalities, local angler clubs, interest groups, scientific associations and universities, individual landowners and other government agencies (e.g. OMAF, OMOE)	Throughout district	
(b) establish a priority system for habitat rehabilitation projects on lakes and watersheds	Coldwater systems	Coolwater/warmwater systems
(c) continue lake and stream rehabilitation programs to improve degraded fish habitat, with emphasis on headwater areas of streams and lakes of local and provincial significance (e.g. Lake Simcoe, Lake Ontario); continue to develop practical expertise in habitat rehabilitation, including that for large rivers	Upper Credit River Upper Duffins Creek Upper Humber River Bogart Creek Kettleby Creek Lake Simcoe (spawning shoals)	Upper Rouge River Talbot River Lake Ontario (artificial reefs) Pefferlaw Brook/Uxbridge Brook

	EXISTING FUNDING	ADDITIONAL FUNDING
(d) remove undesirable barriers to fish migration while maintaining sea lamprey control; prevent the construction of new dams; encourage conversion of existing dams to bottom-draw discharge; consider modification of barriers to allow fish passage, if appropriate	Pefferlaw Brook- fishway Credit River- Reid Milling Dam- fishway Credit River- Georgetown- fishway Credit River- McCarthy's Dam- removed	Rouge River- fish passage at Milne Dam Little Rouge Creek- Woodlands Park Credit River- Reid Milling Dam- operate fishway for Atlantic salmon Credit River- Belfountain Dam- dredge pond Humber River- Albion Mill's Dam- bottom-draw Humber River- Palgrave Dam- by-pass channel Upper Duffins Creek- bottom-draw on ponds
(iii) PROTECT EXISTING FISH STOCKS DURING VULNERABLE PERIODS SUCH AS MIGRATION, SPAWNING AND NURSERY STAGES		
(a) identify migration corridors, spawning areas and nursery habitats	Fall spawning surveys in Credit River for brook and brown trout Informal observations by Conservation Officers Upper Duffins Creek Upper Humber River Kettleby Creek	district wide

	EXISTING FUNDING	ADDITIONAL FUNDING
(IMPLEMENTATION SCHEDULE CONTINUED)		
(b) enforce existing fishing regulations; continue to identify and implement new measures required to protect fish populations; continue to evaluate the effectiveness of existing fish sanctuaries and designate additional sanctuaries if clearly required	district wide e.g. Credit River- close river to winter fishing above Burnhamthorpe Rd.	Introduce special regulations on Upper Credit River on an experimental basis
(c) direct the timing of development activities in and around water	Refine construction timing guidelines used in plan input and review (Appendix 7 and Figure 9), in conjunction with Conservation Authorities; continue to evaluate and amend guidelines as new biological information becomes available	
(d) ensure adherence to mitigation techniques during construction	Limited enforcement	district wide
(e) monitor and implement improvements in mitigation techniques on construction sites, i.e. apply best practicable technology Increase compliance monitoring and enforcement	Limited capability	district wide
iv) PARTITION MIGRATORY FROM RESIDENT POPULATIONS IN SPAWNING AND/OR NURSERY STREAMS AND RIVERS, TO PREVENT OR MINIMIZE INTERSPECIFIC COMPETITION AND TO ENHANCE PRODUCTIVITY		
(a) use existing dams and obstructions as barriers where required; employ fishways to selectively facilitate or restrict upstream access	Credit River- Reid Milling Dam, Norval Dam, Georgetown Dam Duffins Creek- Newman's Dam, Whitevale Dam	
(b) construct weirs or barriers to selectively restrict or facilitate fish migrations	Barrier to fish migration at Inglewood	

	EXISTING FUNDING	ADDITIONAL FUNDING
(IMPLEMENTATION SCHEDULE CONTINUED)		
v) MAINTAIN THE GENETIC INTEGRITY OF EXISTING FISH POPULATIONS		
(a) identify key fish stocks by electrophoretic studies and tagging programs		Support the Lake Simcoe Fisheries Assessment Unit (LSFAU) and the Lake Ontario Fisheries Unit (LOFU) programs for whitefish, walleye, lake trout
(b) identify measures to protect key fish stocks, e.g. refuge lakes	Upper Roslyn Lake selected as refuge for Lake Simcoe whitefish and lake trout	
(c) prevent the introduction of wild, domesticated and non-native fish stocks which would have a negative impact on native or naturalized fish populations	Support the Atlantic Salmon Steering Committee's efforts to determine species interactions Ensure that private hatcheries do not release fish (e.g. rainbow trout) into the wild	
vi) CONTROL EXPLOITATION RATES TO PREVENT OVER-HARVESTING OF FISH STOCKS		
(a) continue to enforce existing creel limits and fishing seasons; investigate need for more enforcement personnel; prioritize enforcement effort	Continue to evaluate harvest and season controls implemented in 1977 on Lake Simcoe to protect coldwater stocks Prepare an enforcement plan	
(b) increase public awareness and appreciation of special fisheries regulations	News releases	Develop extension program to advise anglers of regulations pertaining to catch-and-release angling

	EXISTING FUNDING	ADDITIONAL FUNDING
(IMPLEMENTATION SCHEDULE CONTINUED)		
(c) evaluate the need for proposed and existing regulations based on biological merit and social, economic and ethical concerns; implement these as required (e.g. fly fishing only, special size limits, catch-and-release, gear and bait restrictions)	Experimentally manage upper Credit River for catch and release	Duffins Creek, Upper Humber River other sensitive headwater areas
(d) redirect fishing effort to under-utilized waters and species	Lake Simcoe develop urban fishery strategy	implement urban fishing strategy
vii) IMPROVE PUBLIC ACCESS TO INLAND AND GREAT LAKES FISHERIES		
(a) develop an extension program involving private landowners, angler organizations and municipalities to improve angler awareness, enhance fishing access, and foster working relations amongst these groups	Prepare a brochure, with map, outlining angling access in Maple District	district wide extension program
(b) support land easements and other negotiated agreements with private landowners	e.g. Trout Unlimited restricted access initiatives	become proactive
(c) encourage individuals, organized user groups and municipalities to provide fishing access, or develop new public access points and facilities, through financial incentives and cost-sharing programs	support studies	Throughout district e.g. City of Mississauga waterfront development proposals fun access improvemnts
(d) promote awareness of urban fishing opportunities	Metro Fishing Week; distribute publications such as the Toronto Angler's Guide	Expand urban fishing activities to all appropriate parts of the district (e.g. Port Credit area, Lake Simcoe area)
(e) encourage land acquisition programs by other agencies (e.g. Conservation Authorities) when fisheries will be a primary beneficiary	Credit River Humber River Bogart Creek	Talbot River

	EXISTING FUNDING	ADDITIONAL FUNDING
(IMPLEMENTATION SCHEDULE CONTINUED)		
viii) SUPPLEMENT SELECTED FISH POPULATIONS WITH PLANTINGS OF HEALTHY FISH ACCORDING TO PROVINCIAL STANDARDS AND PROCEDURES		
(a) continue plantings of hatchery reared fish; review fish stocking targets regularly; recognize limits to stocking imposed by availability of forage fish	Lake Ontario Lake Simcoe	
(b) ensure that hatchery fish of the appropriate size are distributed to good quality stocking sites during times when survival will be maximized	all species stocked Support Fisheries Research in Atlantic salmon assessment	Post-stocking assessment of all salmonids
(c) use adult fish transfers where feasible to augment depleted populations or to facilitate range expansion	As appropriate throughout district e.g. Talbot River Walleye	
(d) investigate the applicability of artificial rearing techniques and mini-hatchery projects initiated under CFIP	Walleye- Pefferlaw Brook	
ix) CONSIDER THE INTRODUCTION OF ADDITIONAL OR ALTERNATIVE FISH SPECIES WHERE SUCH AN INTRODUCTION WOULD NOT HAVE A SERIOUS IMPACT ON THE EXISTING DESIRABLE FISH POPULATION		
(a) continue to investigate the feasibility of re-introducing species such as Atlantic Salmon into selected tributaries of Lake Ontario on an experimental basis.	Support Fisheries Research in Atlantic salmon assessment on Credit River	Look at all watersheds
(b) investigate introductions of fish for urban fisheries, e.g. bullheads, northern pike, bass		In urban ponds and reservoirs Consider smallmouth bass at Streetsville and Norval; walleye in lower Humber and Credit Rivers

	EXISTING FUNDING	ADDITIONAL FUNDING
(IMPLEMENTATION SCHEDULE CONTINUED)		
x) ENCOURAGE THE HARVEST OF UNDER-UTILIZED SPECIES		
(a) increase public awareness of under-utilized fish species such as bullhead, carp, sucker and pumpkinseed through an active education and promotional program, particularly in urban areas	Through Metro Fishing Week activities and promotion	Expand program to include other urban areas
xi) IMPROVE FISHERIES IN SUITABLE BUT UNDER-UTILIZED HABITAT		
(a) assess the need for stocking	Duffins Creek- brown trout Altona and Bogart Creeks- brook trout	
(b) consider the removal of barriers to fish colonization	See xi) (d)	See xi) (d)
(c) investigate the introduction of walleye, largemouth bass, smallmouth bass or northern pike into under-producing or urban waters not presently supporting a top predator species	Urban ponds, reservoirs Pefferlaw Brook- walleye Orangeville Reservoir- largemouth bass	
xii) PROVIDE FISHING OPPORTUNITIES BY CREATING ARTIFICIAL "PUT AND TAKE" FISHERIES IN SELECTED WATERS TO SATISFY DEMAND OR DIVERT PRESSURE FROM RESIDENT FISH STOCKS		
(a) investigate need for put-and-take urban fisheries	Conduct creel surveys to assess demand at urban sites	Expand creel program
(b) purchase disease-free fish from private hatcheries, to plant in public waters		Public ponds throughout the district
(c) encourage the private sector to provide artificial fisheries on a "user pays" basis on private lakes and ponds	Throughout district	

	EXISTING FUNDING	ADDITIONAL FUNDING
(IMPLEMENTATION SCHEDULE CONTINUED)		
xiii) ENCOURAGE PUBLIC PARTICIPATION IN THE MANAGEMENT OF LOCAL FISHERIES		
(a) solicit public input and review of major management initiatives	District Fisheries Management Plan Special regulations	
(b) encourage cooperative projects with local angler clubs, interest groups and individual landowners	CFIP (clubs, individuals)	
xiv) DEVELOP A COMPREHENSIVE FISHERIES ASSESSMENT PROGRAM TO MONITOR FISH POPULATIONS AND HABITAT CONDITIONS		
(a) develop an index program to monitor the status of local fish populations; conduct long-term studies on juvenile salmonids; evaluate growth and survival of stocked fish; use tagging to study movement of migratory salmonids; refine potential yield estimates to ensure targets are reasonable		Credit River Duffins Creek Humber River Support LOFU and LSFAU programs Talbot River Lower Holland River Pefferlaw Brook Kettleby Creek Uxbridge Brook Upper Pefferlaw Brook Upper Rouge River
(b) initiate aquatic habitat inventory (survey and habitat assessment components) on unsurveyed waters and waters subject to rapid land use changes; resurvey waters as required data	data is not current	See list in (a) above

	EXISTING FUNDING	ADDITIONAL FUNDING
(IMPLEMENTATION SCHEDULE CONTINUED)		
(c) develop and maintain creel survey programs to monitor demand and exploitation rates	LOFU and LSFAU Urban Fisheries Program	Cooperate with FAU's in shore creels in lower tributaries Upper Credit River in conjunction with the experimental management plan investigating catch-and-release Remainder of Credit River Upper Duffins Creek and Humber River Kettle lakes, rest of urban ponds Upper Pefferlaw Creek and Rouge River
(d) support, at the district level, the long-term studies of the Fisheries Assessment Units (under the direction of their Management Committees) to ensure that fisheries management needs are met	limited support	Creel surveys Index netting
(e) evaluate the impact of migratory fish on resident fish populations	Cooperate with Fisheries Research in Atlantic salmon program in the Credit River	
(f) evaluate the social, economic and biological impacts of fishing derbies and tournaments		Involve Provincial Economist from Fisheries Branch Incorporate into creel surveys Use provincial licencing system to subsample anglers in district
(g) use results from specific fish community studies to direct fisheries management of similar communities		Ongoing implementation of index fishing programs

(IMPLEMENTATION SCHEDULE CONTINUED)

Baitfish Fisheries

	EXISTING FUNDING	ADDITIONAL FUNDING
i) PROTECT AND MAINTAIN EXISTING BAITFISH POPULATIONS		
(a) monitor trends in baitfish harvest through annual returns from commercial baitfish fishermen, and compare with current models for potential yield (Table 1) to ensure that local fish populations in heavily fished areas are not over-exploited	Throughout district and in cooperation with Huronia District	Areas of further study- Lake Simcoe (shiners), Pefferlaw Brook, Humber River, inland waters
(b) prevent over-harvest of baitfish populations by limiting entry to the fishery and restricting harvest where necessary, based on the results of monitoring (see Tactic (a) above) i.e. control number of catch licences allowed in each baitfish management unit; adjust harvest by re-directing effort from over to under-utilized waters	Throughout district	
(c) continue to enforce existing regulations pertinent to the capture and sale of baitfish species, including those to prevent the introduction of competitive fish species and the spread of disease	Enforcement program throughout district	Inform baitfish dealers of regulations pertaining to their operations Develop a communication package to educate anglers about regulations pertaining to the harvest of baitfish for personal use
(d) prevent any baitfish species from local extinction, by controlling harvest and preventing habitat loss; exclude baitfish harvest from areas inhabited by rare species, e.g. redside dace; advise baitfish fishermen about the status and distribution of rare, threatened or endangered species	Throughout district	Develop information package

	EXISTING FUNDING	ADDITIONAL FUNDING
(IMPLEMENTATION SCHEDULE CONTINUED)		
(e) develop education and extension programs as part of an integrated resource management approach to baitfish protection and rehabilitation		Participate or host baitfish workshops designed to inform fishermen and managers
ii) INCREASE THE AVAILABILITY OF BAITFISH TO ANGLERS		
(a) encourage the private aquaculture industry and baitfish fishermen to rear baitfish species (e.g. common white sucker) to reduce demand on natural populations	district wide	Support provincial initiative; provide technical advice and assistance
(b) consider the introduction of suitable baitfish species to suitable waters		Transfer fish (e.g. suckers) to ponds or over dams on watersheds such as the Humber, Etobicoke Creek
(c) encourage local use of baitfish harvested in Maple District	district wide	Encourage local markets to be satisfied before baitfish are exported
iii) DEVELOP A COMPREHENSIVE BAITFISH ASSESSMENT PROGRAM		
(a) develop methodology for acquiring data on fishing effort by fishermen	support efforts of Fisheries Assessment Unit	Participate in any provincial initiative, test methodology on one watershed e.g. Lake Simcoe
(b) evaluate the potential for habitat improvement to increase baitfish yield of streams	Stream rehabilitation projects will also benefit baitfish	Support new rehabilitation projects

	EXISTING FUNDING	ADDITIONAL FUNDING
(IMPLEMENTATION SCHEDULE CONTINUED)		
(c) determine productivity and potential baitfish yields for local waters; conduct assessment studies of representative waters once every five years	apply existing knowledge	Establish watershed priority; Cooperate with Huronia District for Lake Simcoe watersheds
(d) identify critical areas of baitfish habitat, in conjunction with other fish habitat mapping studies		Via aquatic inventory and habitat assessment programs
iv) DEVELOP A COMPREHENSIVE BAITFISH MANAGEMENT PROGRAM		
(a) encourage baitfish dealers to submit accurate, detailed record of harvest and other licenced activities	District Wide	Consider use of incentives, workshops; streamline administrative procedures
(b) maintain waiting lists for baitfish harvest licences, re-allocate licences that have been inactive for two years to people on the waiting list	Throughout district	
(c) re-organize baitfish management areas in Maple District to isolate the Lake Simcoe unit (unit 13); it currently overlaps with river mouths included in units 10, 11 and 12 (Fig. 8)		To implement
(d) encourage the establishment of a Maple District baitfish management council comprised of commercial baitfish fishermen		To implement
(e) investigate the implementation of the "exclusive-use block system" as the standard means of sharing baitfish among harvesters		To pursue

	EXISTING FUNDING	ADDITIONAL FUNDING
(IMPLEMENTATION SCHEDULE CONTINUED)		
Commercial Food-fish Fisheries		
i) LIMIT THE PRESENT LEVEL OF COMMERCIAL FISHING TO THE EXISTING LICENCES IN MAPLE DISTRICT		
(a) monitor harvest on an annual basis	Lakes Simcoe and Ontario	
ii) MAINTAIN VIABLE COMMERCIAL FISHERIES OPERATIONS THAT DO NOT CONFLICT WITH ESTABLISHED OR POTENTIAL RECREATIONAL FISHERIES		
(a) when conflicts occur, consideration will be given to purchasing commercial fisheries, restricting harvest or encouraging use of alternate species or type of gear	Lakes Simcoe and Ontario	
(b) support fishing practices and techniques that prevent the harvest of non-target species e.g. adoption of live capture gear where practical	Lakes Simcoe and Ontario	
iii) ENCOURAGE THE COMMERCIAL FISHING INDUSTRY TO SEEK MARKETS FOR NEW AND UNDER-UTILIZED SPECIES THAT COULD SUPPORT COMMERCIAL HARVEST (e.g. burbot, suckers)	Lake Simcoe and Ontario	

	EXISTING FUNDING	ADDITIONAL FUNDING
(IMPLEMENTATION SCHEDULE CONTINUED)		
iv) SUPPORT THE INFORMATION NEEDS AND ENFORCEMENT REQUIREMENTS OF COMMERCIAL FISH MARKETS IN THE TORONTO AREA, AS PART OF ONTARIO'S MODERNIZATION PROGRAM FOR COMMERCIAL FISHERIES		
(a) continue to devote a full time Conservation Officer to provincial commercial fisheries enforcement in Maple District	Program in place	Hire additional staff as necessary
Non-consumptive Uses of Fisheries		
i) ACTIVELY PROMOTE NON-CONSUMPTIVE USES OF LOCAL AQUATIC RESOURCES		
(a) develop extension and education programs	Issue news releases to inform the public of upcoming viewing events;	Prepare and update pamphlets listing and describing viewing opportunities Talbot River Lake Ontario Urban fisheries

(IMPLEMENTATION SCHEDULE CONTINUED)	EXISTING FUNDING	ADDITIONAL FUNDING
(b) develop fish viewing events and areas	Continue to operate and update the interpretive facilities at Ringwood Fish Culture Station Promote the establishment and preservation of streambank buffer zones for non-consumptive enjoyment of fisheries; install displays to improve public knowledge of the resource e.g. Talbot River, urban locations; improve public access to fish viewing areas e.g Talbot River, Credit River at Streetsville, urban sites (via piers etc.); encourage incorporation of fish viewing facilities in new projects where feasible	develop brochures and displays for other areas in district construct facilities
Protection of Rare, Threatened and Endangered Species		
i) PREVENT THE EXTINCTION OF RARE, THREATENED AND ENDANGERED SPECIES		
(a) establish the distribution and habitat requirements of these species (e.g. redside dace, Lake Simcoe whitefish stock) in Maple District	Use committee on the Status of Endangered Wildlife in Canada reports and local inventory data	Through the aquatic habitat inventory program
(b) protect areas inhabited by these species from the impacts of development and fishing	Through plan input and review and baitfish harvest control	
(c) rehabilitate degraded fish habitat	See Sport Fisheries, strategy ii)	See Sport Fisheries, strategy ii)

	EXISTING FUNDING	ADDITIONAL FUNDING
(IMPLEMENTATION SCHEDULE CONTINUED)		
(d) maintain public awareness of rare, threatened and endangered species	Issue news releases	Prepare brochures advising public, anglers and baitfish fishermen about changes in the status and distribution of species of concern
(e) augment declining populations where feasible	Continue to stock 160,000 whitefish to artificially supplement declining Lake Simcoe stock	Support development of a Lake Simcoe whitefish facility to produce 300,000 whitefish annually

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(see section 1.2.1)

LIST OF ABBREVIATIONS

CFIP -Community Fisheries Involvement Program

COSEWIC -Committee on the Status of Endangered Wildlife in Canada

CVCA -Credit Valley Conservation Authority

DFMP -District Fisheries Management Plan

DFO -Department of Fisheries and Oceans

DLUG -District Land Use Guidelines

DOE -Department of the Environment

GLFC -Great Lakes Fishery Commission

ICBA -Independent Charter Boat Association

IJC -International Joint Commission

LOC -Lake Ontario Committee

LOFU -Lake Ontario Fisheries Unit

LOMC -Lake Ontario Management Committee

LSEMS -Lake Simcoe Environmental Management Strategy

LSFAU -Lake Simcoe Fisheries Assessment Unit

LSIP -Lake Simcoe Implementation Plan

LSRCA -Lake Simcoe Region Conservation Authority
formerly known as the South Lake Simcoe Conservation Authority (SLSCA)

MEI -Morphoedaphic Index

MTRCA -Metropolitan Toronto and Region Conservation Authority

NYDEC -New York Department of Environmental Conservation

OCBA -Ontario Charter Boat Association

OMAF -Ontario Ministry of Agriculture and Food

OMMA -Ontario Ministry of Municipal Affairs

OMNR -Ontario Ministry of Natural Resources

OMOE -Ontario Ministry of the Environment

OMTE -Ontario Ministry of Treasury and Economics

SOCPS -Southern Ontario Co-Ordinated Program Strategy

SPOF -Strategic Plan for Ontario Fisheries

USFWS -United States Fish and Wildlife Service

GLOSSARY

Angler-day
A measure of fishing effort or activity which is equivalent to four angler-hours. This is based on the assumption that the average fishing trip is approximately four hours. One angler-day is considered to be one angler opportunity.

Angler-Hour
A measure of fishing effort or activity and represents one hour of active fishing by one angler.

Baitfish
Any fish in the following groups, as defined by the Ontario Fishing Regulations:

Minnows (family Cyprinidae) except carp and goldfish
Suckers (family Catostomidae)
Ciscoes (family Coregonidae, genus Leucichthys)
Darters (family Percidae, subfamily Etheostomatinae)
Mudminnows (family Umbridae)
Sculpins (family Cottidae)
Sticklebacks (family Gasterosteidae)
Trout-perches (family Percopsidae)

In addition, yellow perch and alewife can be harvested and used as baitfish, but only by special provision of the licence and only in waters of the Great Lakes.

Baitfish Exclusive Use Block System
System by which district land area is divided into distinct units, for each of which only one commercial baitfish harvester is licenced.

Coldwater Lakes
Lakes capable of supporting salmonids; usually have oxygenated hypolimnion (cold bottom-water) during the summer.

Coldwater Streams
Streams capable of supporting salmonids; have summer maximum temperatures of less than about 21°C.

Critical Fish Habitat
Habitat considered to be essential for a fish species or population to complete some critical phase of its life history, e.g. spawning habitat, rearing/nursery habitat or migratory corridors.

Current Use
A measure of use of the fish resources by key users (e.g., anglers, commercial fishermen, bait harvesters, etc.) and presented as angler-days of fishing effort and kilograms of fish harvested for the sport fishery, kilograms of fish harvested for the commercial fishery, and dozens of baitfish harvested by the bait fishery.

Goal
A general purpose to which the Ministry aspires.

Management Zone
A lake or river system for which localized or site-specific management tactics are identified.

MEI
Morphoedaphic Index. A method of estimating the potential yield of a body of water, given its size and level of dissolved nutrients.

Non-Resident
An angler whose principle residence is outside of Ontario.

Potential Yield
An estimated weight of fish that can be removed from a water body on a sustained basis while maintaining fish populations.

Projected Use
The level of fishing effort (angler-days) and/or fish harvested (kg or dozen) that is expected to occur by the year 2000.

Sportfish
Any fish that are legally caught by angling.

Strategy
Policies that may be adopted by District managers to achieve management objectives.

Tactic
Actions that may be taken by District fisheries managers to implement management strategies.

Target
A quantified level of fisheries use or production to be achieved by a specific date.

Underproducing Waters
Waters from which the production of fish is constrained because of stresses such as poor water quality, species composition, or overharvest.

Warmwater Lakes
Lakes other than coldwater lakes; usually too warm, too shallow, or too enriched to have an oxygenated hypolimnion (cold bottom-water) during the summer.

Warmwater Streams
Streams or rivers too warm to support substantial salmonid populations; maximum summer temperature above approximately 21°C.

A1: DETAILED STRATEGIES AND TACTICS

CREDIT RIVER MANAGEMENT ZONE

The Credit River flows into Lake Ontario at Port Credit, and drains an area of 850 km². Major tributaries are Black Creek, Silver Creek, West Credit River and the Alton Branch. Land use in the basin is primarily agricultural, forest or pasture land. Orangeville, Georgetown, Streetsville, Brampton and Mississauga are the major urban centres. Major physiographic features are the interlobate moraine in the headwaters, and the Niagara Escarpment which crosses the middle of the basin from southwest to northeast. This management zone has been divided into three subzones, corresponding to the upper Credit (brook trout and brown trout zone), the middle Credit (migratory salmonid zone) and the lower Credit (warmwater and migratory salmonid zone). Responsibility for the management of the Credit River, particularly subzones 1 and 2, is shared by Maple and Cambridge Districts.

The detailed strategies and tactics in the following table deal with fisheries management issues on the Credit River. **Objectives in this management zone are:**

- partition the river to provide for use by various trout and salmon species, in order to maximize production and fishing opportunities, and minimize interspecific competition

- monitor success of the re-introduction of Atlantic salmon into the Credit River and western Lake Ontario on an experimental basis;

- implement and maintain effective habitat rehabilitation works

- implement special angling regulations in brown trout waters

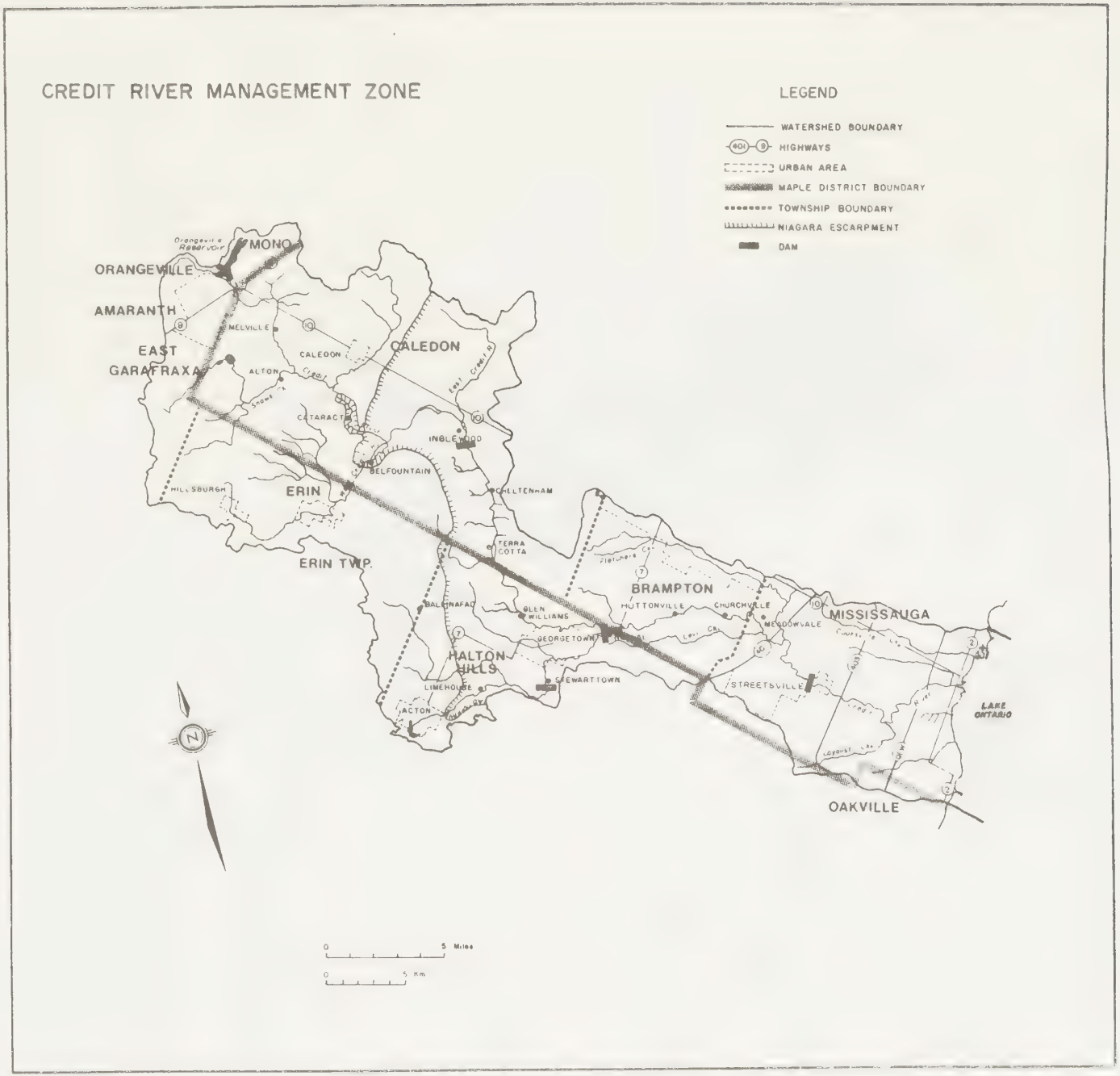
- protect sensitive portions of the stream from the effects of urban development on fish habitat and water quality, particularly spawning and nursery areas for resident and migratory salmonids

- determine effectiveness of fish sanctuaries on the lower Credit River

- improve access to rainbow trout fishery on lower Credit River (e.g. Erindale Flats Park, Credit Valley Conservation Authority property, lakefront as per the Port Credit Master Plan)

- institute effective enforcement to control persistent angling problems such as overharvest, violation of fish sanctuaries, illegal angling techniques (e.g. snagging)

- provide fish viewing opportunities in Streetsville (e.g. at the Reid Milling Dam or in the vicinity of McCarthy's Mill)


CREDIT RIVER MANAGEMENT ZONE
LEGEND
WATERSHED BOUNDARY
HIGHWAYS
URBAN AREA
MAPLE DISTRICT BOUNDARY
TOWNSHIP BOUNDARY
NIAGARA ESCARPMENT
DAM
MONO
ORANGEVILLE
AMARANTH
EAST GARAFRAXA
MELVILLE
CALEDON
ALTON
CATARACT
INGLEWOOD
BELFOUNTAIN
HILLSBURGH
ERIN
ERIN TWP.
CHELTENHAM
TERRA COTTA
BRAMPTON
HUTTONVILLE
CHURCHVILLE
MISSISSAUGA
MEADOWVALE
BALINAFAD
GLEN WILLIAMS
GEORGETOWN
HALTON HILLS
STEWARTTOWN
LIMEHOUSE
ACTON
STREETSVILLE
LAKE ONTARIO
OAKVILLE
N
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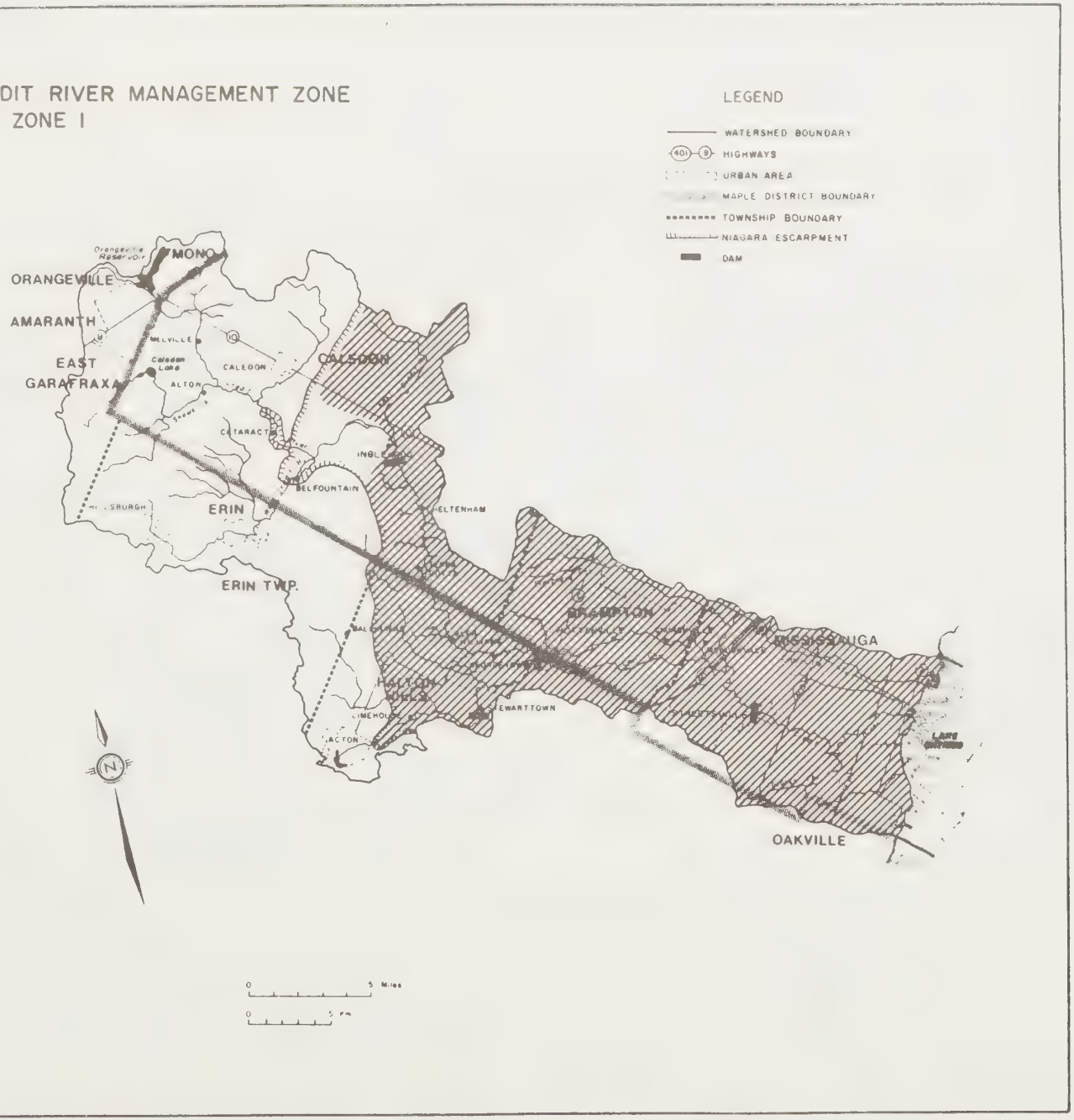
CREDIT RIVER MANAGEMENT ZONE
SUB ZONE 1



1.1 CREDIT RIVER MANAGEMENT ZONE, SUBZONE 1: CREDIT RIVER AND TRIBUTARIES ABOVE INGLEWOOD. THIS SUBZONE IS USED PRIMARILY FOR RESIDENT BROOK AND BROWN TROUT.

STRATEGY I) PROTECT FISHERIES HABITAT BY MINIMIZING THE EFFECTS OF DEVELOPMENT, WITH EMPHASIS ON HEADWATER AND OTHER BIOLOGICALLY SIGNIFICANT HABITAT

TACTICS	COMMENTS
a) identify sensitive areas, including groundwater sources, spawning and nursery habitats, through inventory and habitat assessment programs	In addition to a field crew for stream assessment, use aerial photography, thermal mapping, video cameras
b) enforce existing legislation pertaining to fish habitat protection	
c) implement the federal Department of Fisheries and Oceans policy for the management of fish habitat, including the principle of **no net loss of fish habitat** (Appendix 6)	New initiative. Strive to balance unavoidable habitat losses with habitat replacement on a project-by-project basis
d) liaise with CVCA and other municipal, provincial, federal agencies (e.g. DOE, OMOE, OMAF, Ontario Hydro) to ensure that sensitive habitat is identified and protected; recognize fisheries, where appropriate, as the most sensitive use; continue municipal plan input and review	e.g. involved with MOE and municipality regarding Orangeville Sewage Treatment Plant (issues such as tertiary treatment, water temperature, water quality); support CVCA's land acquisition program
e) implement wetland management policy that will protect headwater and riverine wetlands; evaluate the fisheries significance of the wetlands in Maple District; consider valuable wetlands in the plan input and review process; inform private landowners about valuable wetlands on or adjacent to their property, and the importance of those wetlands to fisheries and water management	Wetlands associated with this zone were classified under the OWES as follows: Caledon Lake (1), Credit Forks Forest (1), Alton-Hillsburgh Complex (2), Credit River at Alton (4), Dufferin Lake (6), Melville Hill Marsh (6), Coulterville (7)
f) minimize stream bank and shoreline disturbance during development; demarcate and protect natural vegetation during and after construction activities	Considered on a case by case basis as part of plan input and review process. Apply vegetative buffer zone guidelines as presented in Appendix 5. Provide copies of the guidelines to all parties involved.
g) review water management schemes impacting fisheries (e.g. hydro power projects, withdrawals for irrigation or industry, groundwater withdrawals)	Consider development of an information package to inform landowners with existing onstream ponds or dams regarding proper water management techniques (e.g. avoid drawdown during fish spawning or egg incubation)
h) require erosion and sediment controls during and after construction, including site rehabilitation as soon after construction as possible, to reduce siltation of receiving waters	Part of plan input and review process; liaise with OMOE, Conservation Authorities, municipalities Encourage use of filter cloth, rapid revegetation techniques (soil bioengineering) Increase compliance monitoring and enforcement

i) discourage dredging and channelization when alternate methods of channel management exist; where channelization is unavoidable, natural channel features are to be incorporated, and passage for fish migration provided where appropriate	Part of plan input and review process; liaise with OMOE, Conservation Authorities, municipalities; increase compliance monitoring and enforcement
j) prohibit direct inflow of untreated stormwater into watercourses	Part of plan input and review process; liaise with OMOE, Conservation Authorities; increase compliance monitoring and enforcement Ensure that stormwater treatment and urban runoff controls reflect current technology, e.g. source control of stormwater, retention/detention facilities, landscape design; require that sediment control ponds be designed to detain at least 125 m^3/ha runoff from the development for at least 12 hours, or be capable of removing particle sizes down to 40 microns (interim guidelines based on a compromise between pond size and cost, and effectiveness of sediment and nutrient removal)
k) work with municipalities to encourage the maintenance and upkeep of stormwater control structures and stream bank stabilization projects	e.g. retention ponds
l) develop education and extension programs to improve public, corporate and governmental understanding of integrated resource management and the ecosystem approach to fisheries protection and rehabilitation; ensure recognition of the biological and socio-economic benefits of healthy fisheries	Resource Education Kit is now available; intended to develop appreciation and understanding of natural resource management at the primary school level Development of a Mitigation Education Program proposed to explain use of landscape ecology and soil bioengineering to mitigate impacts on aquatic ecosystems as a result of development Consider organizing an annual Fisheries Science Education Day to update key agencies on new techniques, current projects
m) prohibit the construction of onstream ponds	

STRATEGY II) REHABILITATE DEGRADED FISH HABITAT, WITH AN EMPHASIS ON SENSITIVE COLDWATER SYSTEMS ALONG THE OAK RIDGES MORAINE; REHABILITATE WARMWATER FISHERIES

TACTICS	COMMENTS
a) maintain established cooperative rehabilitation projects, and encourage new projects with CA's, municipalities, local angler clubs, interest groups, scientific associations and universities, individual landowners and other government agencies (e.g. OMAF, OMOE)	Implement joint rehabilitation projects with these agencies e.g. bank stabilization in Forks of the Credit Provincial Park, habitat enhancement on private property; support participation in CFIP, e.g. Trout Unlimited project to install a bottom-draw on dam in Belfountain Conservation Area
b) establish a priority system for habitat rehabilitation projects	Starting in 1989, develop a five year plan in conjunction with CVCA to prioritize rehabilitation projects

c) continue stream rehabilitation programs to improve degraded fish habitat, with emphasis on headwater areas of streams; continue to develop practical expertise in habitat rehabilitation, including that for large rivers	Review results of boulder placement study at Forks o the Credit
d) remove undesirable barriers to fish migration while maintaining sea lamprey control; prevent the construction of new dams	Evaluate removal of log jams, e.g. Alton property If dam removal is not feasible, encourage conversion to bottom-draw discharge to minimize warming of downstream water; consider modification to allow fish passage (i.e. install fishway)

STRATEGY III) PROTECT EXISTING FISH STOCKS DURING VULNERABLE PERIODS SUCH AS MIGRATION, SPAWNING AND NURSERY STAGES

TACTICS	COMMENTS
a) identify migration routes, timing of spawning runs, spawning areas, and nursery habitats	Continue fall spawning surveys for brook and brown trout
b) enforce existing fishing regulations; continue to identify and implement new measures required to protect fish populations	Designate fish sanctuaries if clearly required. Over next 5 years, evaluate the need to establish sanctuaries to protect brook and brown trout spawning areas Waters in Peel Region above Burnhamthorpe Road will be closed to winter fishing (Sept. 30 to last Saturday in April) Develop and distribute information packages regarding new regulations on the Credit River
c) direct the timing of development activities in and around water; instream work permitted according to the guidelines presented in Appendix 7 and Figure 9, in order to protect the production zones (spawning/nursery habitat) for resident salmonids (brook trout and brown trout)	In conjunction with Conservation Authorities and adjoining districts, amend construction timing guidelines as necessary, when new biological information becomes available; Cambridge district administers the section of this subzone that falls within their jurisdiction in a similar manner
d) ensure adherence to mitigation techniques during construction	
e) monitor and implement improvements in mitigation techniques on construction sites, i.e. apply best practicable technology	Input at plan review stage; monitor during implementation Use filter cloth, soil bioengineering techniques

STRATEGY IV) PARTITION MIGRATORY FROM RESIDENT POPULATIONS IN SPAWNING AND/OR NURSERY STREAMS, TO PREVENT OR MINIMIZE INTERSPECIFIC COMPETITION AND TO ENHANCE PRODUCTIVITY

TACTICS	COMMENTS
a) use existing dams and obstructions as barriers where required; employ fishways to selectively facilitate or restrict upstream access	e.g. falls at Cataract and dam at Belfountain separate resident brook and brown trout populations

b) construct new weirs or barriers as necessary to selectively restrict or facilitate fish migrations	Construct a barrier in the vicinity of Inglewood to block lake-run salmonids at the lower boundary of the resident brook and brown trout zone

STRATEGY V) MAINTAIN THE GENETIC INTEGRITY OF EXISTING FISH POPULATIONS

TACTICS	COMMENTS
a) prevent the introduction of wild, domesticated and non-native fish stocks which would have a negative impact on native or naturalized fish populations	Enforcement of Ontario Fishing Regulations
	Keep Pacific salmon, rainbow trout and Atlantic salmon from resident brook and brown trout zone
	Ensure that private hatcheries do not release domesticated rainbow trout into the wild

STRATEGY VI) CONTROL EXPLOITATION RATES TO PREVENT OVER-HARVESTING OF FISH STOCKS

TACTICS	COMMENTS
a) continue to enforce existing creel limits and fishing seasons; investigate need for more enforcement personnel; prioritize enforcement effort	Resident salmonids are threatened with over-harvest
b) increase public awareness and appreciation of special fisheries regulations	Develop extension program to advise anglers of regulations pertaining to catch-and-release angling
c) evaluate the need for proposed and existing regulations based on biological merit and social, economic and ethical concerns; implement these as required	Consider special regulations such as fly fishing only, special size limits, catch-and-release, gear and bait restrictions
	In waters within Forks of the Credit Provincial Park, implement a possession limit of 2 brook trout, brown trout or combination thereof; target date for implementation is spring, 1990
	Evaluate the impact of these new regulations through an experimental fisheries management project; without regulation, it appears that future angler demand on the upper Credit River will greatly exceed potential yield of the river- this tactic will limit harvest on the upper Credit, while helping to maintain opportunities for angling
d) redirect fishing effort to under-utilized waters and species	e.g. support CVCA's management of ponds on the Sauriol property (possibly for smallmouth bass); prepare brochure to promote fishing for under-utilized species in district

STRATEGY VII) IMPROVE PUBLIC ACCESS TO FISHERIES

TACTICS	COMMENTS
a) develop an extension program involving private landowners, angler organizations and municipalities to improve angler awareness, enhance fishing access, and foster working relations amongst these groups	Prepare a brochure, with map, outlining angling access in Maple District Develop a mailing list of riparian landowners to inform them of fisheries management projects and programs
b) encourage individuals, organized user groups and municipalities to provide fishing access, or develop new public access points and facilities, through financial incentives and cost-sharing programs	Investigate where access is limiting and demand for fishing exists; support land easements and other negotiated agreements with private landowners such as the Trout Unlimited restricted access initiatives
c) encourage land acquisition by other agencies (e.g. CVCA) when fisheries will be a primary beneficiary	Encourage CVCA to expand land acquisition between Hwy 24 and Hwy 136 (important brook trout zone, potential for teaching centre)

STRATEGY VIII) SUPPLEMENT SELECTED FISH POPULATIONS WITH PLANTINGS OF HEALTHY FISH ACCORDING TO PROVINCIAL STANDARDS AND PROCEDURES

TACTICS	COMMENTS
a) use adult fish transfers where feasible to augment depleted populations or to facilitate range expansion	
b) investigate the applicability of artificial rearing techniques and mini-hatchery projects initiated under CFIP	

STRATEGY IX) ENCOURAGE PUBLIC PARTICIPATION IN THE MANAGEMENT OF LOCAL FISHERIES

TACTICS	COMMENTS
a) solicit public input and review of major management initiatives	Review of District Fisheries Management Plan (DFMP) every 5 years; consultation for major experimental management proposals or special regulations
b) encourage cooperative projects with individual landowners, local angler clubs, interest groups	e.g. Trout Unlimited restricted access sections of the river

STRATEGY X) DEVELOP A COMPREHENSIVE FISHERIES ASSESSMENT PROGRAM TO MONITOR FISH POPULATIONS AND HABITAT CONDITIONS

TACTICS	COMMENTS
a) develop an index program to monitor the status of local fish populations	Stream assessment crew to implement as part of the experimental fisheries management project (refer to Strategy VI, Tactic c); conduct long-term studies on juvenile brook and brown trout; refine potential yield estimates to ensure targets are reasonable

b) initiate aquatic habitat inventory (survey and habitat assessment components) on unsurveyed waters and waters subject to rapid land use changes; resurvey previously inventoried waters as required.	In conjunction with the experimental fisheries management project (refer to Strategy VI, Tactic c)
c) develop and maintain creel survey programs to monitor demand and exploitation rates	In conjunction with the experimental fisheries management project (refer to Strategy VI, Tactic c)
d) use results from specific fish community studies to direct fisheries management of similar communities	Apply catch-and-release regulations to other over-fished waters, if the experimental fisheries management project on the upper Credit proves successful

STRATEGY XI) PROTECT AND MAINTAIN EXISTING BAITFISH POPULATIONS

TACTICS	COMMENTS
a) monitor trends in baitfish harvest through annual returns from commercial baitfish fishermen	Compare with current models for potential yield (Table 1) to ensure that local fish populations in heavily fished areas are not over-exploited
b) prevent over-harvest of baitfish populations	Limit entry to the fishery and restrict harvest where necessary, based on the results of monitoring (see Tactic (a) above) i.e. control number of catch licenses allowed in each baitfish management unit; adjust harvest by re-directing effort from over to under-utilized waters
c) continue to enforce existing regulations pertinent to the capture and sale of baitfish species, including those to prevent the introduction of competitive fish species and the spread of disease	Inform baitfish dealers of regulations pertaining to their operations; develop a communication package to educate anglers about regulations pertaining to the harvest of baitfish for personal use
d) prevent any baitfish species from local extinction, by controlling harvest and preventing habitat loss	Exclude baitfish harvest from areas inhabited by rare species, e.g. redside dace; advise baitfish fishermen about the status and distribution of rare, threatened or endangered species
e) develop education and extension programs as part of an integrated resource management approach to baitfish protection and rehabilitation	

STRATEGY XII) INCREASE THE AVAILABILITY OF BAITFISH TO ANGLERS

TACTICS	COMMENTS
a) encourage the private aquaculture industry and baitfish fishermen to rear baitfish species (e.g. common white sucker) to reduce demand on natural populations	Provide technical advice and assistance; refer proponents to MOE for approval to remove and discharge water under the Ontario Water Resources Act
b) consider the introduction of suitable baitfish species to suitable waters	

c) encourage local use of baitfish harvested in Maple District

STRATEGY XIII) DEVELOP A COMPREHENSIVE BAITFISH ASSESSMENT PROGRAM

TACTICS	COMMENTS
a) develop methodology for acquiring data on fishing effort by fishermen	
b) evaluate the potential for habitat improvement to increase baitfish yield of streams	
c) determine productivity and potential baitfish yields for local waters	Conduct assessment studies of representative waters once every five years
d) identify critical areas of baitfish habitat, in conjunction with other fish habitat mapping studies	

STRATEGY XIV) DEVELOP A COMPREHENSIVE BAITFISH MANAGEMENT PROGRAM

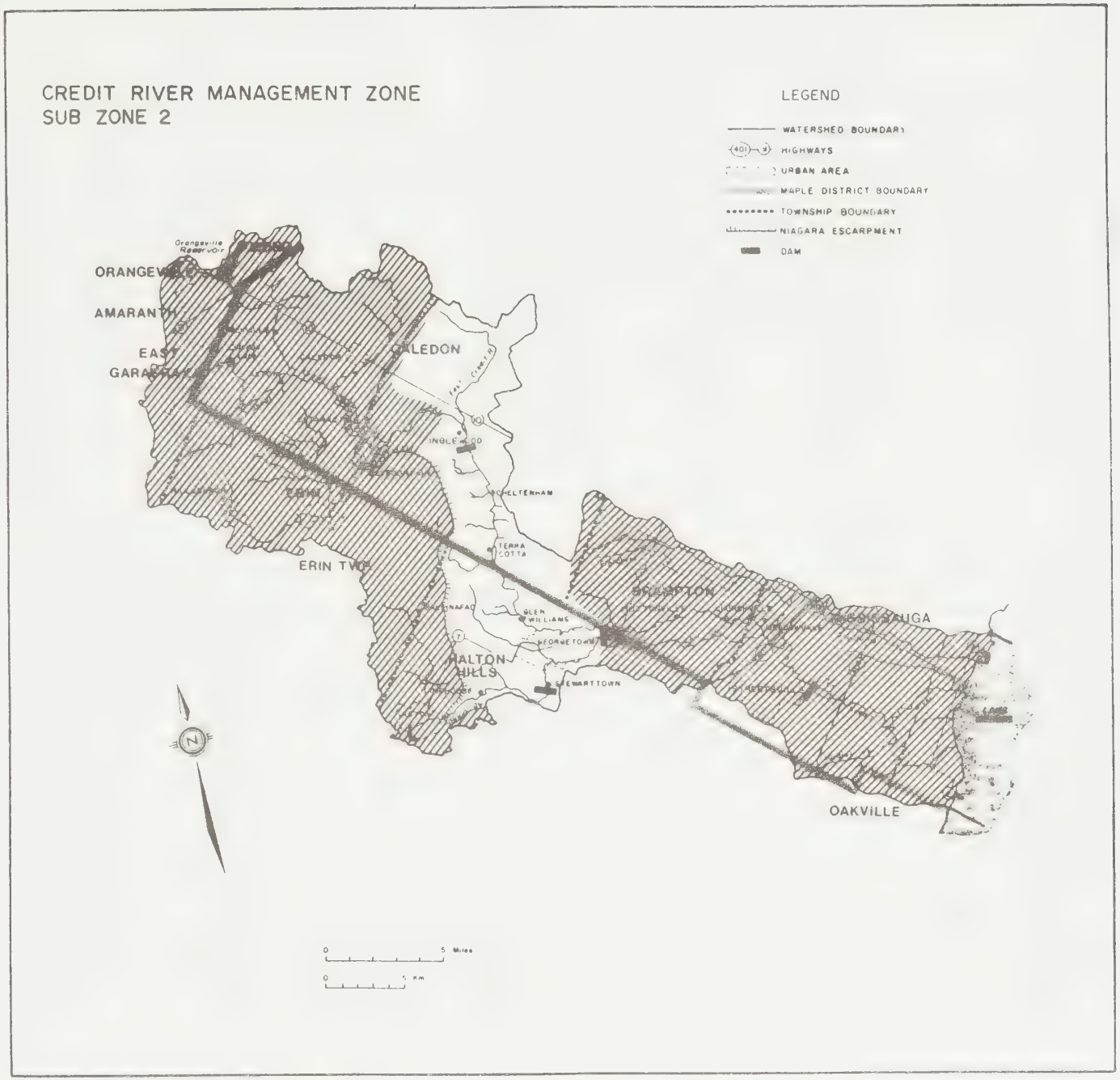
TACTICS	COMMENTS
a) encourage baitfish dealers to submit accurate, detailed record of harvest and other licenced activities	Consider use of incentives, workshops; streamlined administrative procedures
b) maintain waiting lists for baitfish harvest licenses	Review and update every two years; re-allocate licenses that have been inactive for two years to people on the waiting list
c) encourage the establishment of a Maple District baitfish management council comprised of commercial baitfish fishermen	
d) investigate the implementation of the "exclusive-use block system" as the standard means of sharing baitfish among harvesters	

STRATEGY XV) ACTIVELY PROMOTE NON-CONSUMPTIVE USES OF LOCAL AQUATIC RESOURCES

TACTICS	COMMENTS
a) develop extension and education programs	Issue news releases to inform the public of upcoming viewing events; prepare and update pamphlets listing and describing viewing opportunities
b) develop fish viewing events and areas	Promote the establishment and preservation of streambank buffer zones for non-consumptive enjoyment of fisheries; install displays to improve public knowledge of the resource; improve public access to fish viewing areas; encourage incorporation of fish viewing facilities in new projects where feasible

STRATEGY XVI) PREVENT THE EXTINCTION OF RARE, THREATENED AND ENDANGERED SPECIES

TACTICS	COMMENTS
a) establish the distribution and habitat requirements of these species (e.g. redside dace, Lake Simcoe whitefish stock) in Maple District	Through the aquatic habitat inventory program
b) protect areas inhabited by these species from the impacts of development and fishing	Part of plan input and review process and baitfish management program
c) rehabilitate degraded fish habitat	
d) maintain public awareness of rare, threatened and endangered species	Advise baitfish fishermen about the status and distribution of these species
(e) augment declining populations where feasible, by culture	


CREDIT RIVER MANAGEMENT ZONE
SUB ZONE 2
LEGEND
WATERSHED BOUNDARY
HIGHWAYS
URBAN AREA
MAPLE DISTRICT BOUNDARY
TOWNSHIP BOUNDARY
NIAGARA ESCARPMENT
DAM
Orangeville Reservoir
ORANGEVILLE
AMARANTH
EAST GARAFRAXA
CALEDON
INGLEWOOD
CHELTENHAM
ERIN
ERIN TWP.
TERRA COTTA
BRAMPTON
GLEN WILLIAMS
GEORGETOWN
HALTON HILLS
STEWARTTOWN
OAKVILLE
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0 5 Km

1.2 CREDIT RIVER MANAGEMENT ZONE, SUBZONE 2: CREDIT RIVER FROM INGLEWOOD TO NORVAL, INCLUDING TRIBUTARIES SUCH AS BLACK CREEK AND EAST CREDIT RIVER. THIS SUBZONE HAS POTENTIAL FOR REPRODUCTION AND REARING OF LAKE-RUN SALMONIDS.

STRATEGY I) PROTECT FISHERIES HABITAT BY MINIMIZING THE EFFECTS OF DEVELOPMENT, WITH EMPHASIS ON HEADWATER AND OTHER BIOLOGICALLY SIGNIFICANT HABITAT

TACTICS	COMMENTS
a) identify sensitive areas, including groundwater sources, spawning and nursery habitats, through inventory and habitat assessment programs	In addition to a field crew for stream assessment, use aerial photography, thermal mapping, video cameras
b) enforce existing legislation pertaining to fish habitat protection	
c) implement the federal Department of Fisheries and Oceans policy for the management of fish habitat, including the principle of **no net loss of fish habitat** (Appendix 6)	New initiative. Strive to balance unavoidable habitat losses with habitat replacement on a project-by-project basis
d) liaise with CVCA and other municipal, provincial, federal agencies (e.g. DOE, OMOE, OMAF, Ontario Hydro) to ensure that sensitive habitat is identified and protected; recognize fisheries, where appropriate, as the most sensitive use; continue municipal plan input and review	
e) implement wetland management policy that will protect headwater and riverine wetlands; evaluate the fisheries significance of the wetlands in Maple District; consider valuable wetlands in the plan input and review process; inform private landowners about valuable wetlands on or adjacent to their property, and the importance of those wetlands to fisheries and water management	Wetlands associated with this zone were classified under the OWES as follows: Caledon Mountain (2), Caledon Creek Swamp (3), Inglewood Lowlands (5), Kilmanagh Swamp (5), Little Credit River Lowlands (5), Claude Swamp (7)
f) minimize stream bank and shoreline disturbance during development; demarcate and protect natural vegetation during and after construction activities	Considered on a case by case basis as part of plan input and review process. Apply vegetative buffer zone guidelines as presented in Appendix 5. Provide copies of the guidelines to all parties involved.
g) review water management schemes impacting fisheries (e.g. hydro power projects, withdrawals for irrigation or industry, groundwater withdrawals)	Consider development of an information package to inform landowners with existing onstream ponds or dams regarding proper water management techniques (e.g. avoid drawdown during fish spawning or egg incubation)
h) require erosion and sediment controls during and after construction, including site rehabilitation as soon after construction as possible, to reduce siltation of receiving waters	Part of plan input and review process; liaise with OMOE, Conservation Authorities, municipalities Encourage use of filter cloth, rapid revegetation techniques (soil bioengineering) Increase compliance monitoring and enforcement

i) discourage dredging and channelization when alternate methods of channel management exist; where channelization is unavoidable, natural channel features are to be incorporated, and passage for fish migration provided where appropriate	Part of plan input and review process; liaise with OMOE, Conservation Authorities, municipalities; increase compliance monitoring and enforcement
j) prohibit direct inflow of untreated stormwater into watercourses	Part of plan input and review process; liaise with OMOE, Conservation Authorities; increase compliance monitoring and enforcement Ensure that stormwater treatment and urban runoff controls reflect current technology, e.g. source control of stormwater, retention/detention facilities, landscape design; require that sediment control ponds be designed to detain at least 125 m^3/ha runoff from the development for at least 12 hours, or be capable of removing particle sizes down to 40 microns (interim guidelines based on a compromise between pond size and cost, and effectiveness of sediment and nutrient removal)
k) work with municipalities to encourage the maintenance and upkeep of stormwater control structures and stream bank stabilization projects.g. retention ponds	
l) develop education and extension programs to improve public, corporate and governmental understanding of integrated resource management and the ecosystem approach to fisheries protection and rehabilitation; ensure recognition of the biological and socio-economic benefits of healthy fisheries	Resource Education Kit is now available; intended to develop appreciation and understanding of natural resource management at the primary school level Development of a Mitigation Education Program proposed to explain use of landscape ecology and soil bioengineering to mitigate impacts on aquatic ecosystems as a result of development Prepare a guide that illustrates how urban fisheries habitat requirements/fishing access can be incorporated into development proposals Consider organizing an annual Fisheries Science Education Day to update key agencies on new techniques, current projects
m) prohibit the construction of onstream ponds	

STRATEGY II) REHABILITATE DEGRADED FISH HABITAT, WITH AN EMPHASIS ON SENSITIVE COLDWATER SYSTEMS ALONG THE OAK RIDGES MORAINE; REHABILITATE WARMWATER FISHERIES

TACTICS	COMMENTS
a) maintain established cooperative rehabilitation projects,and encourage new projects with conservation authorities municipalities, local angler clubs, interest groups, scientific associations and universities, individual landowners and other government agencies (e.g. OMAF, OMOE)	Implement joint rehabilitation projects with these agencies, possibly in relation to the Atlantic Salmon Experimental Plan; support participation in CFIP; encourage projects relating to the Atlantic Salmon Experimental Plan

b) establish a priority system for habitat rehabilitation projects	Starting in 1988, develop a five year plan in conjunction with CVCA to prioritize rehabilitation projects
c) continue stream rehabilitation programs to improve degraded fish habitat, with emphasis on headwater areas of streams; continue to develop practical expertise in habitat rehabilitation, including that for large rivers	Initiate projects in conjunction with the Atlantic Salmon Experimental Plan; explore use of riparian planting techniques, boulder placement
d) remove undesirable barriers to fish migration while maintaining sea lampprey control; prevent the construction of new dams	If dam removal is not feasible, encourage conversion to bottom-draw discharge to minimize warming of downstream water; consider modification to allow fish passage (i.e. install fishway)

STRATEGY III) PROTECT EXISTING FISH STOCKS DURING VULNERABLE PERIODS SUCH AS MIGRATION, SPAWNING AND NURSERY STAGES

TACTICS	COMMENTS
a) identify migration routes, timing of spawning runs, spawning areas, and nursery habitats	
b) enforce existing fishing regulations; continue to identify and implement new measures required to protect fish populations	Designate fish sanctuaries if clearly required Waters in Peel Region above Burnhamthorpe Road will be closed to winter fishing (Sept. 30 to last Saturday in April) Develop and distribute information packages regarding new regulations on the Credit River
c) direct the timing of development activities in and around water; instream work permitted according to the guidelines presented in Appendix 7 and figure 9 in order to protect production zones (spawning/nursery habitat) for resident salmonids (brook trout and brown trout) and migratory salmonids (Atlantic salmon)	In conjunction with Conservation Authorities and adjoining districts, amend construction timing guidelines as necessary, when new biological information becomes available; construction windows may need to be modified to protect Atlantic salmon, once a run is established; Cambridge district administers the section from approx. Norval to Terra Cotta in a similar manner
d) ensure adherence to mitigation techniques during construction	
e) monitor and implement improvements in mitigation techniques on construction sites, i.e. apply best practicable technology	Input at plan review stage; monitor during implementation Use filter cloth, soil bioengineering techniques

STRATEGY IV) PARTITION MIGRATORY FROM RESIDENT POPULATIONS IN SPAWNING AND/OR NURSERY STREAMS, TO PREVENT OR MINIMIZE INTERSPECIFIC COMPETITION AND TO ENHANCE PRODUCTIVITY

TACTICS	COMMENTS
a) use existing dams and obstructions as barriers where required; employ fishways to selectively facilitate or restrict upstream access	Pass lake-run Atlantic salmon over the Reid Milling Dam at Streetsville, the J. Reed Dam at Norval and the Papermill Dam at Georgetown; Pacific salmon migration will be stopped at Streetsville; rainbow trout will be passed above Streetsville in the spring and managed as a put-and-delayed-take fishery unless Atlantic salmon fail to become established
b) construct new weirs or barriers as necessary to selectively restrict or facilitate fish migrations	Construct a barrier in the vicinity of Inglewood to block lake-run salmonids at the lower boundary of the resident brook and brown trout zone

STRATEGY V) MAINTAIN THE GENETIC INTEGRITY OF EXISTING FISH POPULATIONS

TACTICS	COMMENTS
a) prevent the introduction of wild, domesticated and non-native fish stocks which would have a negative impact on native or naturalized fish populations	Enforcement of Ontario Fishing Regulations Keep Pacific salmon, rainbow trout and Atlantic salmon from resident brook and brown trout zone; avoid mixing hatchery origin fish with wild stock

STRATEGY VI) CONTROL EXPLOITATION RATES TO PREVENT OVER-HARVESTING OF FISH STOCKS

TACTICS	COMMENTS
a) continue to enforce existing creel limits and fishing seasons; investigate need for more enforcement personnel; prioritize enforcement effort	
b) increase public awareness and appreciation of special fisheries regulations	Develop extension program to advise anglers of any new regulations pertaining to the Atlantic Salmon Experimental Plan (e.g. catch-and-release)
c) evaluate the need for proposed and existing regulations based on biological merit and social, economic and ethical concerns; implement these as required	Consider special regulations to maximize the chances of success of the reintroduction of Atlantic salmon
d) redirect fishing effort to under-utilized waters and speciesPrepare brochure to promote fishing for under-utilized species in district	

STRATEGY VII) IMPROVE PUBLIC ACCESS TO FISHERIES

TACTICS	COMMENTS
a) develop an extension program involving private landowners, angler organizations and municipalities to improve angler awareness, enhance fishing access, and foster working relations amongst these groups	Prepare a brochure, with map, outlining angling access in Maple District
b) encourage individuals, organized user groups and municipalities to provide fishing access, or develop new public access points and facilities, through financial incentives and cost-sharing programs	Investigate where access is limiting and demand for fishing exists; support land easements and other negotiated agreements with private landowners
c) promote awareness of urban fishing opportunities	Through the Urban Fishing Program (e.g. events similar to Metro Fishing Week); distribution of publications e.g. Toronto Angler's Guide
d) encourage land acquisition by other agencies (e.g. CVCA) when fisheries will be a primary beneficiary	

STRATEGY VIII) CONSIDER THE INTRODUCTION OF ADDITIONAL OR ALTERNATIVE FISH SPECIES WHERE SUCH AN INTRODUCTION WOULD NOT HAVE A SERIOUS IMPACT ON THE EXISTING DESIRABLE FISH POPULATION

TACTICS	COMMENTS
a) continue to investigate the feasibility of reintroducing Atlantic salmon on an experimental basis	Stocking 40,000 Atlantic salmon near Inglewood is occuring as part of the Atlantic Salmon Experimental Plan

STRATEGY IX) ENCOURAGE PUBLIC PARTICIPATION IN THE MANAGEMENT OF LOCAL FISHERIES

TACTICS	COMMENTS
a) solicit public input and review of major management initiatives	Review of DFMP every 5 years; consultation for major experimental management proposals or special regulations
b) encourage cooperative projects with individual landowners, local angler clubs, interest groups	

STRATEGY X) DEVELOP A COMPREHENSIVE FISHERIES ASSESSMENT PROGRAM TO MONITOR FISH POPULATIONS AND HABITAT CONDITIONS

TACTICS	COMMENTS
a) develop an index program to monitor the status of local fish populations	Stream assessment crew to implement; support Fisheries Research assessment re: Atlantic Salmon Experimental Plan; refine potential yield estimates to ensure targets are reasonable

b) initiate aquatic habitat inventory (survey and habitat assessment components) on unsurveyed waters and waters subject to rapid land use changes; resurvey waters with data inventories greater than 5 years old	In conjunction with the Atlantic Salmon Experimental Plan
c) develop and maintain creel survey programs to monitor demand and exploitation rates	In conjunction with the Atlantic Salmon Experimental Plan
d) evaluate the impact of migratory fish on resident fish populations	Support Fisheries Research assessment re: Atlantic Salmon Experimental Plan
e) support, at the district level, the long-term studies of the Lake Ontario Fisheries Unit (under the direction of the Lake Ontario Management Committee) and Fisheries Research, to ensure that fisheries management needs are met	Applies mainly to Atlantic salmon reintroduction in this subzone
f) use results from specific fish community studies to direct fisheries management of similar communities	Potential to apply the results of some aspects of the research studies on Atlantic salmon in Wilmot Creek to the Credit River

STRATEGY XI) PROTECT AND MAINTAIN EXISTING BAITFISH POPULATIONS

TACTICS	COMMENTS
a) monitor trends in baitfish harvest through annual returns from commercial baitfish fishermen	Compare with current models for potential yield (Table 1) to ensure that local fish populations in heavily fished areas are not over-exploited
b) prevent over-harvest of baitfish populations	Limit entry to the fishery and restrict harvest where necessary, based on the results of monitoring (see Tactic (a) above) i.e. control number of catch licenses allowed in each baitfish management unit; adjust harvest by re-directing effort from over to under-utilized waters
c) continue to enforce existing regulations pertinent to the capture and sale of baitfish species, including those to prevent the introduction of competitive fish species and the spread of disease	Inform baitfish dealers of regulations pertaining to their operations; develop a communication package to educate anglers about regulations pertaining to the harvest of baitfish for personal use
d) prevent any baitfish species from local extinction, by controlling harvest and preventing habitat loss	Exclude baitfish harvest from areas inhabited by rare species, e.g. redside dace; advise baitfish fishermen about the status and distribution of rare, threatened or endangered species
e) develop education and extension programs as part of an integrated resource management approach to baitfish protection and rehabilitation	

STRATEGY XII) INCREASE THE AVAILABILITY OF BAITFISH TO ANGLERS

TACTICS	COMMENTS
a) encourage the private aquaculture industry and baitfish fishermen to rear baitfish species (e.g. common white sucker) to reduce demand on natural populations	Provide technical advice and assistance; refer proponents to MOE for approval to remove and discharge water under the Ontario Water Resources Act
b) consider the introduction of suitable baitfish species to suitable waters	
c) encourage local use of baitfish harvested in Maple District	

STRATEGY XIII) DEVELOP A COMPREHENSIVE BAITFISH ASSESSMENT PROGRAM

TACTICS	COMMENTS
a) develop methodology for acquiring data on fishing effort by fishermen	
b) evaluate the potential for habitat improvement to increase baitfish yield of streams	
c) determine productivity and potential baitfish yields for local waters	Conduct assessment studies of representative waters once every five years
d) identify critical areas of baitfish habitat, in conjunction with other fish habitat mapping studies	

STRATEGY XIV) DEVELOP A COMPREHENSIVE BAITFISH MANAGEMENT PROGRAM

TACTICS	COMMENTS
a) encourage baitfish dealers to submit accurate, detailed record of harvest and other licenced activities	Consider use of incentives, workshops; streamlined administrative procedures
b) maintain waiting lists for baitfish harvest licenses	Review and update every two years; re-allocate licenses that have been inactive for two years to people on the waiting list
c) encourage the establishment of a Maple District baitfish management council comprised of commercial baitfish fishermen	
d) investigate the implementation of the "exclusive-use block system" as the standard means of sharing baitfish among harvesters	

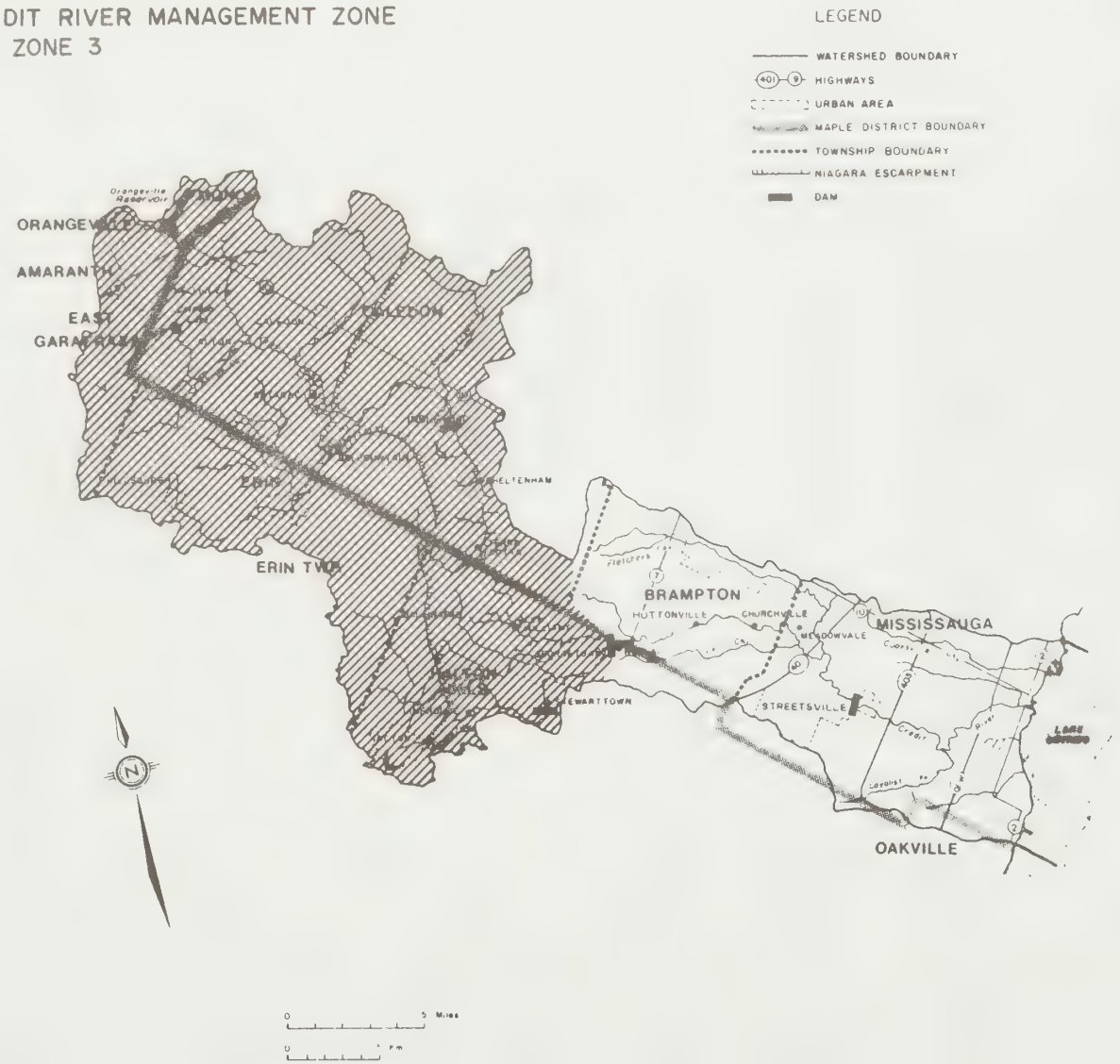
STRATEGY XV) ACTIVELY PROMOTE NON-CONSUMPTIVE USES OF LOCAL AQUATIC RESOURCES

TACTICS	COMMENTS
a) develop extension and education programs	Issue news releases to inform the public of upcoming viewing events; prepare and update pamphlets listing and describing viewing opportunities
b) develop fish viewing events and areas	Promote the establishment and preservation of streambank buffer zones for non-consumptive enjoyment of fisheries; install displays to improve public knowledge of the resource; improve public access to fish viewing areas; encourage incorporation of fish viewing facilities in new projects where feasible

STRATEGY XVI) PREVENT THE EXTINCTION OF RARE, THREATENED AND ENDANGERED SPECIES

TACTICS	COMMENTS
a) establish the distribution and habitat requirements of these species (e.g. redside dace, Lake Simcoe whitefish stock) in Maple District	Through the aquatic habitat inventory program
b) protect areas inhabited by these species from the impacts of development and fishing	Part of plan input and review process and baitfish management program
c) rehabilitate degraded fish habitat	
d) maintain public awareness of rare, threatened and endangered species	Advise baitfish fishermen about the status and distribution of these species
(e) augment declining populations where feasible, by culture	

CREDIT RIVER MANAGEMENT ZONE
SUB ZONE 3



1.3 CREDIT RIVER MANAGEMENT ZONE, SUBZONE 3: CREDIT RIVER AND TRIBUTARIES BELOW NORVAL. THIS SUBZONE IS USED PRIMARILY FOR WARMWATER FISHERIES, AS TRANSITIONAL HABITAT FOR STOCKED JUVENILE SALMONIDS, AND AS A MIGRATION ROUTE FOR LAKE-RUN SALMONIDS.

STRATEGY I) PROTECT FISHERIES HABITAT BY MINIMIZING THE EFFECTS OF DEVELOPMENT, WITH EMPHASIS ON HEADWATER AND OTHER BIOLOGICALLY SIGNIFICANT HABITAT

TACTICS	COMMENTS
a) identify sensitive areas, including groundwater sources, spawning and nursery habitats, through inventory and habitat assessment programs	In addition to a field crew for stream assessment, use aerial photography, thermal mapping, video cameras
b) enforce existing legislation pertaining to fish habitat protection	
c) implement the federal Department of Fisheries and Oceans policy for the management of fish habitat, including the principle of **no net loss of fish habitat** (Appendix 6)	New initiative. Strive to balance unavoidable habitat losses with habitat replacement on a project-by-project basis
d) liaise with CVCA and other municipal, provincial, federal and international agencies (e.g. OMOE, OMAF, Ontario Hydro, DOE, DFO, IJC, Lake Ontario Management Committee (LOMC)) to ensure that sensitive habitat is identified and protected; recognize fisheries, where appropriate, as the most sensitive use; continue municipal plan input and review	e.g. involved with DFO regarding sea lamprey control barrier at the Reid Milling dam at Streetsville
e) implement wetland management policy that will protect riverine and estuarine wetlands; evaluate the fisheries significance of the wetlands in Maple District; consider valuable wetlands in the plan input and review process; inform private landowners about valuable wetlands on or adjacent to their property, and the importance of those wetlands to fisheries and water management	Huttonville Valley Wetland has been designated as a Class 6 wetland
f) minimize stream bank and shoreline disturbance during development; demarcate and protect natural vegetation during and after construction activities	Considered on a case by case basis as part of plan input and review process. Apply vegetative buffer zone guidelines as presented in Appendix 5. Provide copies of the guidelines to all parties involved.
g) review water management schemes impacting fisheries (e.g. hydro power projects, withdrawals for irrigation or industry, groundwater withdrawals)	e.g. Huttonville micro hydro project Consider development of an information package to inform landowners with existing onstream ponds or dams regarding proper water management techniques (e.g. avoid drawdown during fish spawning or egg incubation)
h) require erosion and sediment controls during and after construction, including site rehabilitation as soon after construction as possible, to reduce siltation of receiving waters	Part of plan input and review process; liaise with OMOE, Conservation Authorities, municipalities Encourage use of filter cloth, rapid revegetation techniques (soil bioengineering)

Increase compliance monitoring and enforcement	
i) discourage dredging and channelization when alternate methods of channel management exist; where channelization is unavoidable, natural channel features are to be incorporated, and passage for fish migration provided where appropriate	Part of plan input and review process; liaise with OMOE, Conservation Authorities, municipalities; increase compliance monitoring and enforcement
j) prohibit direct inflow of untreated stormwater into watercourses	Part of plan input and review process; liaise with OMOE, Conservation Authorities; increase compliance monitoring and enforcement Ensure that stormwater treatment and urban runoff controls reflect current technology, e.g. source control of stormwater, retention/detention facilities, landscape design; require that sediment control ponds be designed to detain at least 125 m^3/ha runoff from the development for at least 12 hours, or be capable of removing particle sizes down to 40 microns (interim guidelines based on a compromise between pond size and cost, and effectiveness of sediment and nutrient removal)
k) work with municipalities to encourage the maintenance and upkeep of stormwater control structures and stream bank stabilization projects	e.g. retention ponds
l) develop education and extension programs to improve public, corporate and governmental understanding of integrated resource management and the ecosystem approach to fisheries protection and rehabilitation; ensure recognition of the biological and socio-economic benefits of healthy fisheries	Resource Education Kit is now available; intended to develop appreciation and understanding of natural resource management at the primary school level Development of a Mitigation Education Program proposed to explain use of landscape ecology and soil bioengineering to mitigate impacts on aquatic ecosystems as a result of development Prepare a guide that illustrates how urban fisheries habitat requirements/fishing access can be incorporated into development proposals Consider organizing an annual Fisheries Science Education Day to update key agencies on new techniques, current projects
m) prohibit the construction of onstream ponds	

STRATEGY II) REHABILITATE DEGRADED FISH HABITAT, WITH AN EMPHASIS ON SENSITIVE COLDWATER SYSTEMS ALONG THE OAK RIDGES MORAINE; REHABILITATE WARMWATER FISHERIES

TACTICS	COMMENTS
a) maintain established cooperative rehabilitation projects, and encourage new projects with CA's, municipalities, local angler clubs, interest groups, scientific associations and universities, individual landowners and other government agencies (e.g. OMAF, OMOE)	Implement joint rehabilitation projects with these agencies; support participation in CFIP.
b) establish a priority system for habitat rehabilitation projects	Starting in 1989, develop a five year plan in conjunction with CVCA to prioritize rehabilitation projects
c) initiate stream rehabilitation programs to improve degraded fish habitat, with emphasis on headwater areas of tributary streams; continue to develop practical expertise in habitat rehabilitation, including that for large rivers	e.g. Huttonville tributary requires fencing and riparian planting Try boulder placement on the lower Credit River to create habitat for migrating salmonids and warmwater fish e.g. at Erindale Flats
d) remove undesirable barriers to fish migration while maintaining sea lamprey control; prevent the construction of new dams	If dam removal is not feasible, encourage conversion to bottom-draw discharge to minimize warming of downstream water; consider modification to allow or restrict fish passage (i.e. install fishway and lamprey barrier such has been done at the Reid Milling Dam in Streetsville)

STRATEGY III) PROTECT EXISTING FISH STOCKS DURING VULNERABLE PERIODS SUCH AS MIGRATION, SPAWNING AND NURSERY STAGES

TACTICS	COMMENTS
a) identify migration routes, timing of spawning runs, spawning areas, and nursery habitats	Determine extent of smallmouth bass spawning in lower river
b) enforce existing fishing regulations; continue to identify and implement new measures required to protect fish populations	Continue to evaluate the effectiveness of existing fish sanctuaries Consider special regulations to maximize the chances of success of the reintroduction of Atlantic salmon Waters in Peel Region above Burnhamthorpe Road will be closed to winter fishing (Sept. 30 to last Saturday in April) to protect trout from anglers claiming to be fishing for alternate species (e.g. suckers) Develop and distribute information packages regarding new regulations on the Credit River

c) direct the timing of development activities in and around water; instream work permitted according to the guidelines presented in Appendix 7 and figure 9 in order to protect the migratory corridor for salmonids, production zones (spawning/nursery habitat) for salmonids, and the migratory corridor and production zones for warmwater species	In conjunction with Conservation Authorities and adjoining districts, amend construction timing guidelines as necessary, when new biological information becomes available; construction windows may need to be modified to protect Atlantic salmon, once a run is established; construction proposals in nearshore areas of Lake Ontario will be evaluated on a case-by-case basis; section from the mouth to Streetsville has been designated as a migratory corridor for salmonids (Atlantic salmon, Pacific salmon, rainbow trout, brown trout); from Streetsville to Norval is considered a potential production zone for migratory salmonids (Atlantic salmon, and rainbow trout); all of this subzone has been designated as a migratory corridor and/or production zone for warmwater species (e.g. bass)
d) ensure adherence to mitigation techniques during construction	
e) monitor and implement improvements in mitigation techniques on construction sites, i.e. apply best practicable technology	Input at plan review stage; monitor during implementation Use filter cloth, soil bioengineering techniques

STRATEGY IV) PARTITION MIGRATORY FROM RESIDENT POPULATIONS IN SPAWNING AND/OR NURSERY STREAMS, TO PREVENT OR MINIMIZE INTERSPECIFIC COMPETITION AND TO ENHANCE PRODUCTIVITY

TACTICS	COMMENTS
a) use existing dams and obstructions as barriers where required; employ fishways to selectively facilitate or restrict upstream access	Pass lake-run Atlantic salmon over the Reid Milling Dam at Streetsville, the J. Reed Dam at Norval and the Papermill Dam at Georgetown; Pacific salmon migration will be stopped at Streetsville; rainbow trout will be passed above Streetsville in the spring; rainbow trout will be managed as a put-and-delayed-take fishery unless Atlantic salmon fail to become established

STRATEGY V) CONTROL EXPLOITATION RATES TO PREVENT OVER-HARVESTING OF FISH STOCKS

TACTICS	COMMENTS
a) continue to enforce existing creel limits and fishing seasons; investigate need for more enforcement personnel; prioritize enforcement effort	
b) increase public awareness and appreciation of special fisheries regulations	Develop extension program to advise anglers of any new regulations pertaining to the Atlantic Salmon Experimental Plan (e.g. catch-and-release)

c) evaluate the need for proposed and existing regulations based on biological merit and social, economic and ethical concerns; implement these as required	Consider special regulations to maximize the chances of success of the reintroduction of Atlantic salmon
d) redirect fishing effort to under-utilized waters and species	Promote fishing in this subzone (e.g. for smallmouth bass); prepare brochure to promote fishing for under-utilized species in district

STRATEGY VI) IMPROVE PUBLIC ACCESS TO FISHERIES

TACTICS	COMMENTS
a) develop an extension program involving private landowners, angler organizations and municipalities to improve angler awareness, enhance fishing access, and foster working relations amongst these groups	Prepare a brochure, with map, outlining angling access in Maple District; investigate the potential for improved public viewing in the vicinity of the fishway at the Reid Milling Dam in Streetsville Develop a mailing list of riparian landowners to inform them of fisheries management projects and programs
b) encourage individuals, organized user groups and municipalities to provide fishing access, or develop new public access points and facilities, through financial incentives and cost-sharing programs	Investigate where access is limiting and demand for fishing exists; support land easements and other negotiated agreements with private landowners; support those aspects of the Port Credit Harbour renewal program which will increase shore angling access and improve boat launching facilities;
c) promote awareness of urban fishing opportunities	Expand events such as Metro Fishing Week to include all appropriate waterfront areas in the district; distribution of publications e.g. Toronto Angler's Guide
d) encourage land acquisition by other agencies (e.g. CVCA) when fisheries will be a primary beneficiary	
e) improve access to rainbow trout fishery	Extend upper boundary of year-round fishing to Burnhamthorpe Road; sanctuaries on lower Credit River to remain in effect; waters in Peel Region above Burnhamthorpe Road will be closed to winter fishing (Sept. 30 to last Saturday in April)

STRATEGY VII) SUPPLEMENT SELECTED FISH POPULATIONS WITH PLANTINGS OF HEALTHY FISH ACCORDING TO PROVINCIAL STANDARDS AND PROCEDURES

TACTICS	COMMENTS
a) use adult fish transfers where feasible to augment depleted populations or to facilitate range expansion	Potential for smallmouth bass fishery exists between Streetsville and Norval; smallmouth bass are presently abundant below Streetsville; consider potential for walleye in the lower river

b) continue plantings of hatchery reared fish; review fish stocking targets regularly Recognize limits to stocking imposed by availability of forage in Lake Ontario	Annual stocking targets for the lower Credit River are: chinook- 200,000 fingerlings coho- 100,000 yearlings; 50,000 fingerlings rainbow trout- 60,000 yearlings
c) ensure that hatchery fish of the appropriate size are distributed to good quality stocking sites during times when survival will be maximized	

STRATEGY VIII) CONSIDER THE INTRODUCTION OF ADDITIONAL OR ALTERNATIVE FISH SPECIES WHERE SUCH AN INTRODUCTION WOULD NOT HAVE A SERIOUS IMPACT ON THE EXISTING DESIRABLE FISH POPULATION

TACTICS	COMMENTS
a) continue to investigate the feasibility of reintroducing Atlantic salmon on an experimental basis	Stocking 40,000 Atlantic salmon near Inglewood is occuring as part of the Atlantic Salmon Experimental Plan; will use lower Credit River as migratory corridor

STRATEGY IX) ENCOURAGE THE HARVEST OF UNDER-UTILIZED SPECIES

TACTICS	COMMENTS
a) increase public awareness of under-utilized species such as bullhead, carp, sucker and creek chub through an education and promotional program in urban areas and warmwater habitats on the lower river	e.g. Erindale Flats, mouth of river

STRATEGY X) ENCOURAGE PUBLIC PARTICIPATION IN THE MANAGEMENT OF LOCAL FISHERIES

TACTICS	COMMENTS
a) solicit public input and review of major management initiatives	Review of DFMP every 5 years; consultation for major experimental management proposals or special regulations
b) encourage cooperative projects with individual landowners, local angler clubs, interest groups	

STRATEGY XI) DEVELOP A COMPREHENSIVE FISHERIES ASSESSMENT PROGRAM TO MONITOR FISH POPULATIONS AND HABITAT CONDITIONS

TACTICS	COMMENTS
a) develop an index program to monitor the status of local fish populations	Stream assessment crew to implement; conduct long-term studies on juvenile salmonids (stocked, natural); refine potential yield estimates to ensure targets are reasonable

b) initiate aquatic habitat inventory (survey and habitat assessment components) on unsurveyed waters and water subject to rapid land use changes; resurvey previously inventoried waters as required.	
c) develop and maintain creel survey programs to monitor demand and exploitation rates	e.g. for Pacific salmon, rainbow trout, smallmouth bass, Atlantic salmon In cooperation with LOFU
d) evaluate the impact of migratory fish on resident fish populations	
e) support, at the district level, the long-term studies of the Lake Ontario Fisheries Unit (under the direction of the Lake Ontario Management Committee) and Fisheries Research, to ensure that fisheries management needs are met	Applies to angler surveys, lamprey monitoring, stocking assessment (e.g. growth, survival, diet) in the lower reaches of the river and river mouth
f) use results from specific fish community studies to direct fisheries management of similar communities	

STRATEGY XII) PROTECT AND MAINTAIN EXISTING BAITFISH POPULATIONS

TACTICS	COMMENTS
a) monitor trends in baitfish harvest through annual returns from commercial baitfish fishermen	Compare with current models for potential yield (Table 1) to ensure that local fish populations in heavily fished areas are not over-exploited
b) prevent over-harvest of baitfish populations	Limit entry to the fishery and restrict harvest where necessary, based on the results of monitoring (see Tactic (a) above) i.e. control number of catch licenses allowed in each baitfish management unit; adjust harvest by re-directing effort from over to under-utilized waters
c) continue to enforce existing regulations pertinent to the capture and sale of baitfish species, including those to prevent the introduction of competitive fish species and the spread of disease	Inform baitfish dealers of regulations pertaining to their operations; develop a communication package to educate anglers about regulations pertaining to the harvest of baitfish for personal use
d) prevent any baitfish species from local extinction, by controlling harvest and preventing habitat loss	Exclude baitfish harvest from areas inhabited by rare species, e.g. redside dace; advise baitfish fishermen about the status and distribution of rare, threatened or endangered species
e) develop education and extension programs as part of an integrated resource management approach to baitfish protection and rehabilitation	

STRATEGY XIII) INCREASE THE AVAILABILITY OF BAITFISH TO ANGLERS

TACTICS	COMMENTS
a) encourage the private aquaculture industry and baitfish fishermen to rear baitfish species (e.g. common white sucker) to reduce demand on natural populations	Provide technical advice and assistance; refer proponents to MOE for approval to remove and discharge water under the Ontario Water Resources Act
b) consider the introduction of suitable baitfish species to suitable waters	
c) encourage local use of baitfish harvested in Maple District	

STRATEGY XIV) DEVELOP A COMPREHENSIVE BAITFISH ASSESSMENT PROGRAM

TACTICS	COMMENTS
a) develop methodology for acquiring data on fishing effort by fishermen	
b) evaluate the potential for habitat improvement to increase baitfish yield of streams	
c) determine productivity and allowable baitfish yields for local waters	Conduct assessment studies of representative waters once every five years
d) identify critical areas of baitfish habitat, in conjunction with other fish habitat mapping studies	

STRATEGY XV) DEVELOP A COMPREHENSIVE BAITFISH MANAGEMENT PROGRAM

TACTICS	COMMENTS
a) encourage baitfish dealers to submit accurate, detailed record of harvest and other licenced activities	Consider use of incentives, workshops; streamlined administrative procedures
b) maintain waiting lists for baitfish harvest licenses	Review and update every two years; re-allocate licenses that have been inactive for two years to people on the waiting list
c) encourage the establishment of a Maple District baitfish management council comprised of commercial baitfish fishermen	
d) investigate the implementation of the "exclusive-use block system" as the standard means of sharing baitfish among harvesters	

STRATEGY XVI) ACTIVELY PROMOTE NON-CONSUMPTIVE USES OF LOCAL AQUATIC RESOURCES

TACTICS	COMMENTS
a) develop extension and education programs	Issue news releases to inform the public of upcoming viewing events; prepare and update pamphlets listing and describing viewing opportunities particularly in urban areas
b) develop fish viewing events and areas	Promote the establishment and preservation of streambank buffer zones for non-consumptive enjoyment of fisheries; install displays to improve public knowledge of the resource particularly in urban areas; continue to operate and update the interpretive facilities a Ringwood Fish Culture Station; improve public access to fish viewing areas e.g. Streetsville- salmon spawning runs; encourage incorporation of fish viewing facilities in new projects where feasible

STRATEGY XVII) PREVENT THE EXTINCTION OF RARE, THREATENED AND ENDANGERED SPECIES

TACTICS	COMMENTS
a) establish the distribution and habitat requirements of these species (e.g. redside dace, Lake Simcoe whitefish stock) in Maple District	Through the aquatic habitat inventory program; redside dace occurs in the headwaters of Fletcher's Ck. (near Brampton)
b) protect areas inhabited by these species from the impacts of development and fishing	Part of plan input and review process and baitfish management program
c) rehabilitate degraded fish habitat	
d) maintain public awareness of rare, threatened and endangered species	Advise baitfish fishermen about the status and distribution of these species
(e) augment declining populations where feasible, by culture	

HUMBER RIVER MANAGEMENT ZONE

The Humber River flows into Lake Ontario in western Toronto, and drains an area of 857 km^2. Major tributaries are the West Humber River, East Humber River, Centreville Creek and Black Creek. Land use in the basin is primarily agricultural, pasture and forest in the headwaters, with estate residential, urban and industrial land in the lower basin. Bolton, Woodbridge, Oak Ridges and Metro Toronto are the major urban centres. Upper tributaries arise in the interlobate moraine; lower tributaries arise on the Peel and Till Plains. This management zone has been divided into two subzones, corresponding to the upper Humber (brook trout and brown trout zone), and the lower Humber (warmwater and migratory salmonid zone).

The detailed strategies and tactics in the following table deal with fisheries management issues on the Humber River. Objectives in this management zone are:

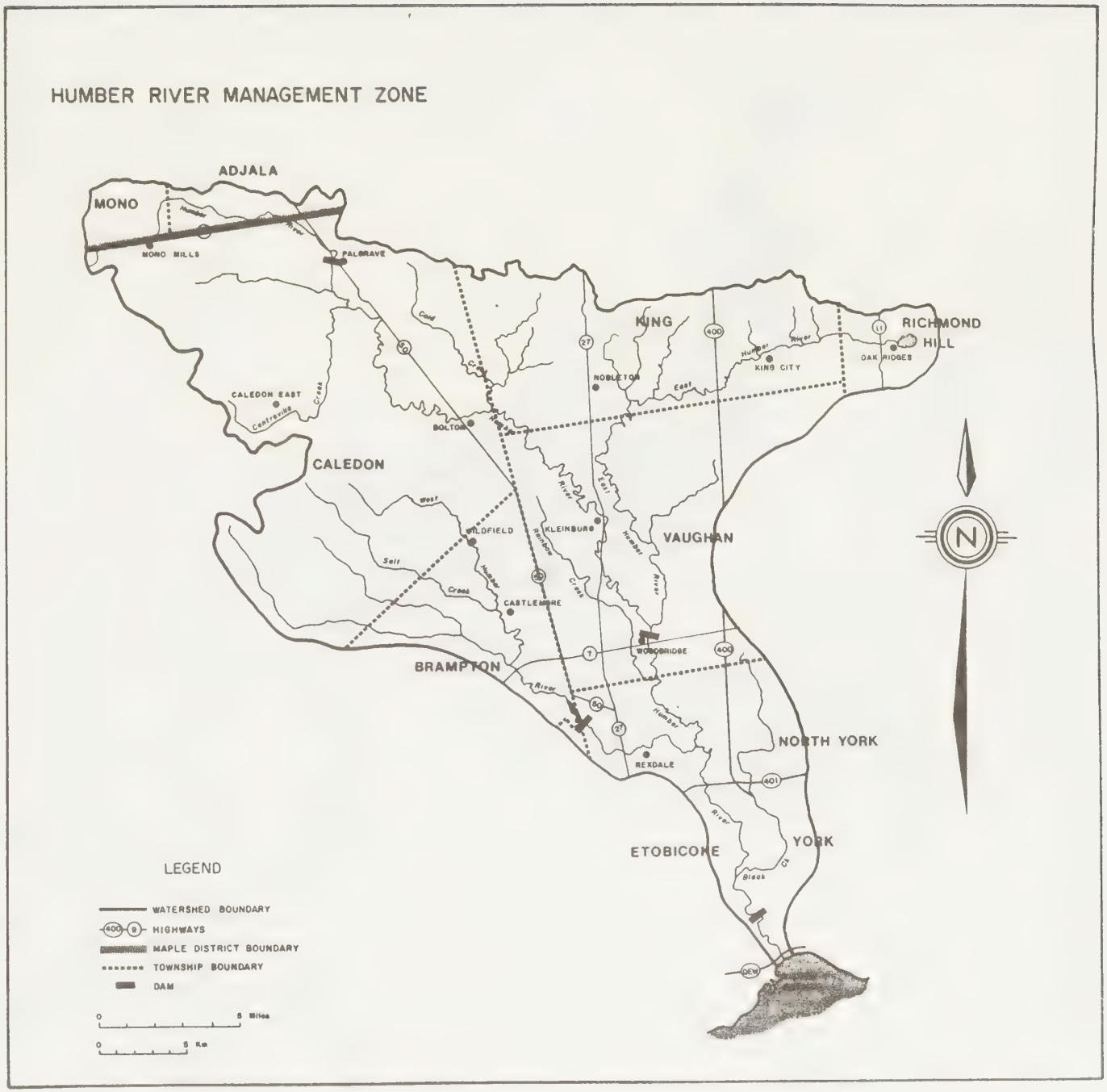
- modify or remove barriers to fish migration in the lower Humber River (where appropriate),to allow migratory salmonids access to sections of the watershed which are potential production zones

- extend the resident brook and brown trout zone by reforestation projects and removal of dams or conversion to bottom-draw discharge

- protect sensitive portions of the stream from the effects of urban development on fish habitat and water quality

- improve access for anglers

- implement and maintain effective habitat rehabilitation works in the upper Humber River


HUMBER RIVER MANAGEMENT ZONE
ADJALA
MONO
MONO MILLS
PALGRAVE
KING
RICHMOND HILL
OAK RIDGES
KING CITY
NOBLETON
CALEDON EAST
BOLTON
CALEDON
WILDFIELD
KLEINBURG
VAUGHAN
CASTLEMORE
WOODBRIDGE
BRAMPTON
REXDALE
NORTH YORK
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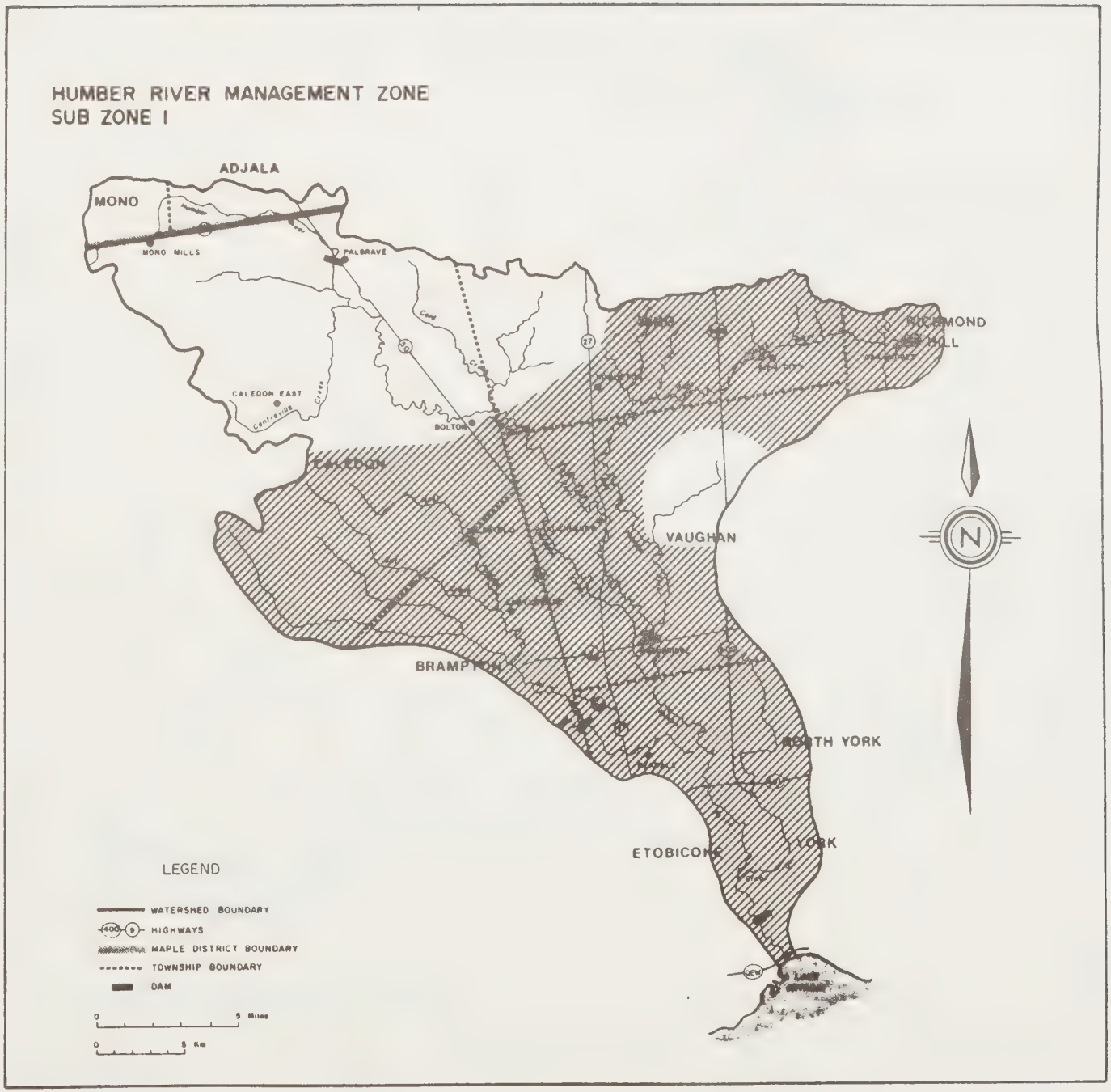
HUMBER RIVER MANAGEMENT ZONE
SUB ZONE 1
ADJALA
MONO
MONO MILLS
PALGRAVE
CALEDON EAST
Centreville
BOLTON
CALEDON
BRAMPTON
VAUGHAN
RICHMOND HILL
NORTH YORK
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YORK
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LEGEND
WATERSHED BOUNDARY
HIGHWAYS
MAPLE DISTRICT BOUNDARY
TOWNSHIP BOUNDARY
DAM
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2.1 HUMBER RIVER MANAGEMENT ZONE, SUBZONE 1: HUMBER RIVER AND TRIBUTARIES ABOVE BOLTON, INCLUDING CENTREVILLE CREEK, COLD CREEK, AND TESTON TRIBUTARY. THIS SUBZONE IS USED PRIMARILY FOR RESIDENT BROOK AND BROWN TROUT.

STRATEGY I) PROTECT FISHERIES HABITAT BY MINIMIZING THE EFFECTS OF DEVELOPMENT, WITH EMPHASIS ON HEADWATER AND OTHER BIOLOGICALLY SIGNIFICANT HABITAT

TACTICS	COMMENTS
a) identify sensitive areas, including groundwater sources, spawning and nursery habitats, through inventory and habitat assessment programs	In addition to a field crew for stream assessment, use aerial photography, thermal mapping, video cameras
b) enforce existing legislation pertaining to fish habitat protection	
c) implement the federal Department of Fisheries and Oceans policy for the management of fish habitat, including the principle of **no net loss of fish habitat** (Appendix 6)	New initiative. Strive to balance unavoidable habitat losses with habitat replacement on a project-by-project basis
d) liaise with MTRCA and other municipal, provincial, federal agencies (e.g. OMOE, OMAF, Ontario Hydro, DOE) to ensure that sensitive habitat is identified and protected; recognize fisheries, where appropriate, as the most sensitive use; continue municipal plan input and review	
e) develop and implement wetland management policy that will protect headwater and riverine wetlands; evaluate the fisheries significance of the wetlands in Maple District; consider valuable wetlands in the plan input and review process; inform private landowners about valuable wetlands on or adjacent to their property, and the importance of those wetlands to fisheries and water management	Wetlands associated with this zone were classified under the OWES as follows: Centreville Creek Complex (3), Sleswick Complex (3), Kennifick Complex (3), Cold Creek Swamp (4), Ballyaroy Swamp (6), Widgett Lake Marsh (6), Caledon East Complex (7), Harris Wetland (7), Tamarac Estate Complex (7)
f) minimize stream bank and shoreline disturbance during development; demarcate and protect natural vegetation during and after construction activities	Considered on a case by case basis as part of plan input and review process. Apply vegetative buffer zone guidelines as presented in Appendix 5. Provide copies of the guidelines to all parties involved.
g) review water management schemes impacting fisheries (e.g. hydro power projects, withdrawals for irrigation or industry, groundwater withdrawals)	Consider development of an information package to inform landowners with existing onstream ponds or dams regarding proper water management techniques (e.g. avoid drawdown during fish spawning or egg incubation)
h) require erosion and sediment controls during and after construction, including site rehabilitation as soon after construction as possible, to reduce siltation of receiving waters	Part of plan input and review process; liaise with OMOE, Conservation Authorities, municipalities Encourage use of filter cloth, rapid revegetation techniques (soil bioengineering) Increase compliance monitoring and enforcement

i) discourage dredging and channelization when alternate methods of channel management exist; where channelization is unavoidable, natural channel features are to be incorporated, and passage for fish migration provided where appropriate	Part of plan input and review process; liaise with OMOE, Conservation Authorities, municipalities; increase compliance monitoring and enforcement
j) prohibit direct inflow of untreated stormwater into watercourses	Part of plan input and review process; liaise with OMOE, Conservation Authorities; increase compliance monitoring and enforcement
	Ensure that stormwater treatment and urban runoff controls reflect current technology, e.g. source control of stormwater, retention/detention facilities, landscape design; require that sediment control ponds be designed to detain at least 125 m^3/ha runoff from the development for at least 12 hours, or be capable of removing particle sizes down to 40 microns (interim guidelines based on a compromise between pond size and cost, and effectiveness of sediment and nutrient removal)
k) work with municipalities to encourage the maintenance and upkeep of stormwater control structures and stream bank stabilization projects	
l) develop education and extension programs to improve public, corporate and governmental understanding of integrated resource management and the ecosystem approach to fisheries protection and rehabilitation; ensure recognition of the biological and socio-economic benefits of healthy fisheries	Resource Education Kit is now available; intended to develop appreciation and understanding of natural resource management at the primary school level
	Development of a Mitigation Education Program proposed to explain use of landscape ecology and soil bioengineering to mitigate impacts on aquatic ecosystems as a result of development
	Prepare a guide that illustrates how urban fisheries habitat requirements/fishing access can be incorporated into development proposals
	Consider organizing an annual Fisheries Science Education Day to update key agencies on new techniques, current projects
m) prohibit the construction of onstream ponds	

STRATEGY II) REHABILITATE DEGRADED FISH HABITAT, WITH AN EMPHASIS ON SENSITIVE COLDWATER SYSTEMS ALONG THE OAK RIDGES MORAINE; REHABILITATE WARMWATER FISHERIES

TACTICS	COMMENTS
a) maintain established cooperative rehabilitation projects, and encourage new projects with CA's, municipalities, local angler clubs, interest groups, scientific associations and universities, individual landowners and other government agencies (e.g. OMAF, OMOE)	Implement joint rehabilitation projects with these agencies; support participation in CFIP,

b) establish a priority system for habitat rehabilitation projects	starting in 1989 develop a five year plan in conjunction with MTRCA to prioritize rehabilitation projects
c) continue stream rehabilitation programs to improve degraded fish habitat, with emphasis on headwater areas of streams; continue to develop practical expertise in habitat rehabilitation, including that for large rivers	Coordinate activities with Huronia District; consider instream boulder placement, bank stabilization, riparian planting, livestock fencing
d) remove undesirable barriers to fish migration while maintaining sea lamprey control; prevent the construction of new dams	If dam removal is not feasible, encourage conversion to bottom-draw discharge (or construct bypass channel) to minimize warming of downstream water; e.g. dams at Albion Hills Conserservation Area and Palgrave; consider modification to allow fish passage (i.e. install fishway)

STRATEGY III) PROTECT EXISTING FISH STOCKS DURING VULNERABLE PERIODS SUCH AS MIGRATION, SPAWNING AND NURSERY STAGES

TACTICS	COMMENTS
a) identify migration routes, timing of spawning runs, spawning areas, and nursery habitats	
b) enforce existing fishing regulations; continue to identify and implement new measures required to protect fish populations	Continue to monitor high-use areas, e.g. main Humber River along Hwy 9; coordinate with Huronia District
c) direct the timing of development activities in and around water; instream work permitted according to the guidelines presented in Appendix 7 in order to protect the production zones (spawning/nursery habitat) for resident salmonids (brook trout and brown trout)	In conjunction with Conservation Authorities and adjoining districts, amend construction timing guidelines as necessary, when new biological information becomes available
d) ensure adherence to mitigation techniques during construction	
e) monitor and implement improvements in mitigation techniques on construction sites, i.e. apply best practicable technology	Input at plan review stage; monitor during implementation Use filter cloth, soil bioengineering techniques

STRATEGY IV) PARTITION MIGRATORY FROM RESIDENT POPULATIONS IN SPAWNING AND/OR NURSERY STREAMS, TO PREVENT OR MINIMIZE INTERSPECIFIC COMPETITION AND TO ENHANCE PRODUCTIVITY

TACTICS	COMMENTS
a) use existing dams and obstructions as barriers where required; employ fishways to selectively facilitate or restrict upstream access	Rainbow trout will have access to potential production zones (e.g. between Woodbridge and Bolton); Pacific salmon and brown trout will be stopped lower in the watershed; no migratory salmonids will be allowed into the resident brook and brown trout zone
b) construct new weirs or barriers as necessary to selectively restrict or facilitate fish migrations	

STRATEGY V) MAINTAIN THE GENETIC INTEGRITY OF EXISTING FISH POPULATIONS

TACTICS	COMMENTS
a) prevent the introduction of wild, domesticated and non-native fish stocks which would have a negative impact on native or naturalized fish populations	Enforcement of Ontario Fishing Regulations

STRATEGY VI) CONTROL EXPLOITATION RATES TO PREVENT OVER-HARVESTING OF FISH STOCKS

TACTICS	COMMENTS
a) continue to enforce existing creel limits and fishing seasons; investigate need for more enforcement personnel; prioritize enforcement effort	Coordinate with Huronia District
b) increase public awareness and appreciation of special fisheries regulations	
c) evaluate the need for proposed and existing regulations based on biological merit and social, economic and ethical concerns; implement these as required	If overharvest becomes an issue, consider implementation of special regulations, based on the results of the experimental plan slated for the Upper Credit
d) redirect fishing effort to under-utilized waters and species	Prepare brochure to promote fishing for under-utilized species in district

STRATEGY VII) IMPROVE PUBLIC ACCESS TO FISHERIES

TACTICS	COMMENTS
a) develop an extension program involving private landowners, angler organizations and municipalities to improve angler awareness, enhance fishing access, and foster working relations amongst these groups	Prepare a brochure, with map, outlining angling access in Maple District Develop a mailing list of riparian landowners to inform them of fisheries management projects and programs
b) encourage individuals, organized user groups and municipalities to provide fishing access, or develop new public access points and facilities, through financial incentives and cost-sharing programs	Investigate where access is limiting and demand for fishing exists; support land easements and other negotiated agreements with private landowners
c) encourage land acquisition by other agencies (e.g. MTRCA) when fisheries will be a primary beneficiary	

STRATEGY VIII) SUPPLEMENT SELECTED FISH POPULATIONS WITH PLANTINGS OF HEALTHY FISH ACCORDING TO PROVINCIAL STANDARDS AND PROCEDURES

TACTICS	COMMENTS
a) evaluate the need to supplement existing brook and brown trout populations with hatchery-reared fish	Consider extending the range and production of brook and brown trout in the Palgrave to Bolton reach, Centreville Creek, Cold Creek, Teston tributary
b) ensure that hatchery fish of the appropriate size are distributed to good quality stocking sites during times when survival will be maximized	
c) use adult fish transfers where feasible to augment depleted populations or to facilitate range expansion	See a) above
d) investigate the applicability of artificial rearing techniques and mini-hatchery projects initiated under CFIP	

STRATEGY IX) PROVIDE FISHING OPPORTUNITIES BY CREATING ARTIFICIAL PUT-AND-TAKE FISHERIES IN SELECTED WATERS TO SATISFY DEMAND OR DIVERT PRESSURE FROM RESIDENT FISH STOCKS

TACTICS	COMMENTS
a) encourage the private sector to provide artificial fisheries on a "user pays" basis, on private lakes and ponds	Where overharvest is an issue, redirect demand to alternate water e.g. fishing opportunities are available at MTRCA's Glen Haffy property

STRATEGY X) ENCOURAGE PUBLIC PARTICIPATION IN THE MANAGEMENT OF LOCAL FISHERIES

TACTICS	COMMENTS
a) solicit public input and review of major management initiatives	Review of DFMP every 5 years; consultation for major experimental management proposals or special regulations
b) encourage cooperative projects with individual landowners, local angler clubs, interest groups	

STRATEGY XI) DEVELOP A COMPREHENSIVE FISHERIES ASSESSMENT PROGRAM TO MONITOR FISH POPULATIONS AND HABITAT CONDITIONS

TACTICS	COMMENTS
a) develop an index program to monitor the status of local fish populations	Stream assessment crew to implement; refine potential yield estimates to ensure targets are reasonable
b) initiate aquatic habitat inventory (survey and habitat assessment components) on unsurveyed waters and waters subject to rapid land use changes; resurvey previously inventoried waters as required.	

c) develop and maintain creel survey programs to monitor demand and exploitation rates

d) use results from specific fish community studies to direct fisheries management of similar communities

STRATEGY XII) PROTECT AND MAINTAIN EXISTING BAITFISH POPULATIONS

TACTICS	COMMENTS
a) monitor trends in baitfish harvest through annual returns from commercial baitfish fishermen	Compare with current models for potential yield (Table 1) to ensure that local fish populations in heavily fished areas are not over-exploited
b) prevent over-harvest of baitfish populations	Limit entry to the fishery and restrict harvest where necessary, based on the results of monitoring (see Tactic (a) above) i.e. control number of catch licenses allowed in each baitfish management unit; adjust harvest by re-directing effort from over to under-utilized waters
c) continue to enforce existing regulations pertinent to the capture and sale of baitfish species, including those to prevent the introduction of competitive fish species and the spread of disease	Inform baitfish dealers of regulations pertaining to their operations; develop a communication package to educate anglers about regulations pertaining to the harvest of baitfish for personal use
d) prevent any baitfish species from local extinction, by controlling harvest and preventing habitat loss	Exclude baitfish harvest from areas inhabited by rare species, e.g. redside dace; advise baitfish fishermen about the status and distribution of rare, threatened or endangered species
e) develop education and extension programs as part of an integrated resource management approach to baitfish protection and rehabilitation	

STRATEGY XIII) INCREASE THE AVAILABILITY OF BAITFISH TO ANGLERS

TACTICS	COMMENTS
a) encourage the private aquaculture industry and baitfish fishermen to rear baitfish species (e.g. common white sucker) to reduce demand on natural populations	Provide technical advice and assistance; refer proponents to MOE for approval to remove and discharge water under the Ontario Water Resources Act
b) consider the introduction of suitable baitfish species to suitable waters	
c) encourage local use of baitfish harvested in Maple District	

STRATEGY XIV) DEVELOP A COMPREHENSIVE BAITFISH ASSESSMENT PROGRAM

TACTICS	COMMENTS
a) develop methodology for acquiring data on fishing effort by fishermen	
b) evaluate the potential for habitat improvement to increase baitfish yield of streams	
c) determine productivity and potential baitfish yields for local waters	Conduct assessment studies of representative waters once every five years
d) identify critical areas of baitfish habitat, in conjunction with other fish habitat mapping studies	

STRATEGY XV) DEVELOP A COMPREHENSIVE BAITFISH MANAGEMENT PROGRAM

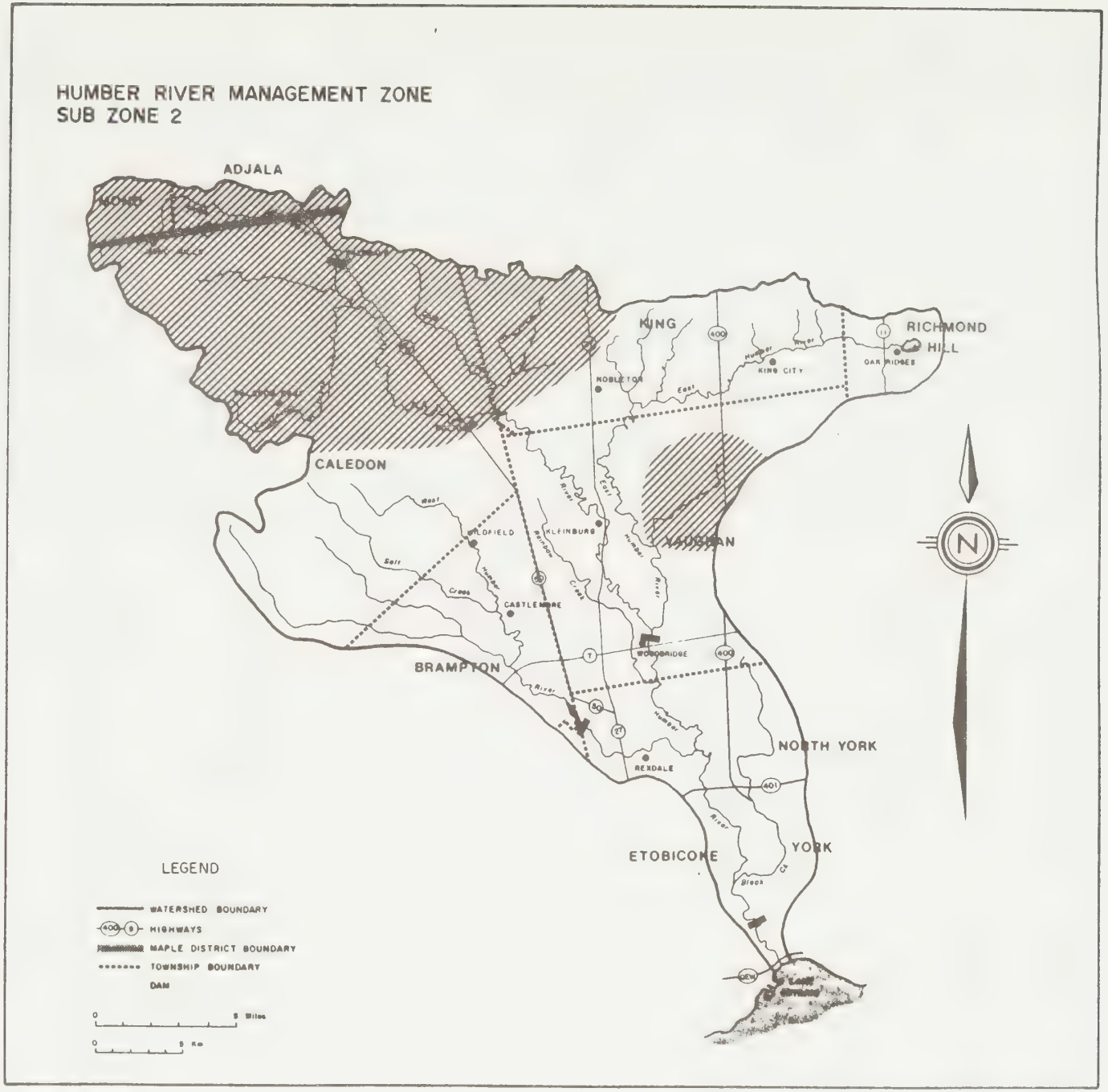
TACTICS	COMMENTS
a) encourage baitfish dealers to submit accurate, detailed record of harvest and other licenced activities	Consider use of incentives, workshops; streamlined administrative procedures
b) maintain waiting lists for baitfish harvest licenses	Review and update every two years; re-allocate licenses that have been inactive for two years to people on the waiting list
c) encourage the establishment of a Maple District baitfish management council comprised of commercial baitfish fishermen	
d) investigate the implementation of the "exclusive-use block system" as the standard means of sharing baitfish among harvesters	

STRATEGY XVI) ACTIVELY PROMOTE NON-CONSUMPTIVE USES OF LOCAL AQUATIC RESOURCES

TACTICS	COMMENTS
a) develop extension and education programs	Issue news releases to inform the public of upcoming viewing events; prepare and update pamphlets listing and describing viewing opportunities
b) develop fish viewing events and areas	Promote the establishment and preservation of streambank buffer zones for non-consumptive enjoyment of fisheries; install displays to improve public knowledge of the resource; improve public access to fish viewing areas; encourage incorporation of fish viewing facilities in new projects where feasible

STRATEGY XVII) PREVENT THE EXTINCTION OF RARE, THREATENED AND ENDANGERED SPECIES

TACTICS	COMMENTS
a) establish the distribution and habitat requirements of these species (e.g. redside dace, Lake Simcoe whitefish stock) in Maple District	Through the aquatic habitat inventory program
b) protect areas inhabited by these species from the impacts of development and fishing	Part of plan input and review process and baitfish management program
c) rehabilitate degraded fish habitat	
d) maintain public awareness of rare, threatened and endangered species	Advise baitfish fishermen about the status and distribution of these species
(e) augment declining populations where feasible, by culture	


HUMBER RIVER MANAGEMENT ZONE
SUB ZONE 2
ADJALA
KING
RICHMOND HILL
CALEDON
VAUGHAN
BRAMPTON
NORTH YORK
ETOBICOKE
YORK
N
LEGEND
WATERSHED BOUNDARY
HIGHWAYS
MAPLE DISTRICT BOUNDARY
TOWNSHIP BOUNDARY
DAM

2.2 HUMBER RIVER MANAGEMENT ZONE, SUBZONE 2: MAIN HUMBER RIVER AND TRIBUTARIES BELOW BOLTON. THIS SUBZONE IS USED PRIMARILY FOR WARMWATER FISHERIES, WITH SOME HARVEST OF LAKE-RUN SALMONIDS ON THE MAIN HUMBER RIVER AT OLD MILL.

STRATEGY I) PROTECT FISHERIES HABITAT BY MINIMIZING THE EFFECTS OF DEVELOPMENT, WITH EMPHASIS ON HEADWATER AND OTHER BIOLOGICALLY SIGNIFICANT HABITAT

TACTICS	COMMENTS
a) identify sensitive areas, including groundwater sources, spawning and nursery habitats, through inventory and habitat assessment programs	In addition to a field crew for stream assessment, use aerial photography, thermal mapping, video cameras
b) enforce existing legislation pertaining to fish habitat protection	
c) implement the federal Department of Fisheries and Oceans policy for the management of fish habitat, including the principle of **no net loss of fish habitat** (Appendix 6)	New initiative. Strive to balance unavoidable habitat losses with habitat replacement on a project-by-project basis
d) liaise with MTRCA and other municipal, provincial, federal agencies (e.g. DOE, DFO, IJC, OMOE, OMAF, Ontario Hydro) to ensure that sensitive habitat is identified and protected; recognize fisheries, where appropriate, as the most sensitive use; continue municipal plan input and review	
e) develop and implement wetland management policy that will protect riverine and estuarine wetlands; evaluate the fisheries significance of the wetlands in Maple District; consider valuable wetlands in the plan input and review process; inform private landowners about valuable wetlands on or adjacent to their property, and the importance of those wetlands to fisheries and water management	Wetlands associated with this zone were classified under the OWES as follows: Humber River Marshes (3), King City Complex (6), Rowntree Mill Swamp (6), Forester Marsh (7)
f) minimize stream bank and shoreline disturbance during development; demarcate and protect natural vegetation during and after construction activities	Considered on a case by case basis as part of plan input and review process. Apply vegetative buffer zone guidelines as presented in Appendix 5. Provide copies of the guidelines to all parties involved.
g) review water management schemes impacting fisheries (e.g. hydro power projects, withdrawals for irrigation or industry, groundwater withdrawals)	Consider development of an information package to inform landowners with existing onstream ponds or dams regarding proper water management techniques (e.g. avoid drawdown during fish spawning or egg incubation)
h) require erosion and sediment controls during and after construction, including site rehabilitation as soon after construction as possible, to reduce siltation of receiving waters	Part of plan input and review process; liaise with OMOE, Conservation Authorities, municipalities
	Encourage use of filter cloth, rapid revegetation techniques (soil bioengineering)
	Increase compliance monitoring and enforcement

i) discourage dredging and channelization when alternate methods of channel management exist; where channelization is unavoidable, natural channel features are to be incorporated, and passage for fish migration provided where appropriate	Part of plan input and review process; liaise with OMOE, Conservation Authorities, municipalities; increase compliance monitoring and enforcement
j) prohibit direct inflow of untreated stormwater into watercourses	Part of plan input and review process; liaise with OMOE, Conservation Authorities; increase compliance monitoring and enforcement Ensure that stormwater treatment and urban runoff controls reflect current technology, e.g. source control of stormwater, retention/detention facilities, landscape design; require that sediment control ponds be designed to detain at least 125 m^3/ha runoff from the development for at least 12 hours, or be capable of removing particle sizes down to 40 microns (interim guidelines based on a compromise between pond size and cost, and effectiveness of sediment and nutrient removal)
k) work with municipalities to encourage the maintenance and upkeep of stormwater control structures and stream bank stabilization projects	e.g. retention ponds
l) develop education and extension programs to improve public, corporate and governmental understanding of integrated resource management and the ecosystem approach to fisheries protection and rehabilitation; ensure recognition of the biological and socio-economic benefits of healthy fisheries	Resource Education Kit is now available; intended to develop appreciation and understanding of natural resource management at the primary school level Development of a Mitigation Education Program proposed to explain use of landscape ecology and soil bioengineering to mitigate impacts on aquatic ecosystems as a result of development Prepare a guide that illustrates how urban fisheries habitat requirements/fishing access can be incorporated into development proposals Consider organizing an annual Fisheries Science Education Day to update key agencies on new techniques, current projects
m) prohibit the construction of onstream ponds	

STRATEGY II) REHABILITATE DEGRADED FISH HABITAT, WITH AN EMPHASIS ON SENSITIVE COLDWATER SYSTEMS ALONG THE OAK RIDGES MORAINE; REHABILITATE WARMWATER FISHERIES

TACTICS	COMMENTS
a) maintain established cooperative rehabilitation projects, and encourage new projects with CA's, municipalities, local angler clubs, interest groups, scientific associations and universities, individual landowners and other government agencies (e.g. OMAF, OMOE)	Implement joint rehabilitation projects with these agencies; support participation in CFIP.

b) establish a priority system for habitat rehabilitation projects	Starting in 1989, develop a five year plan in conjunction with MTRCA to prioritize rehabilitation projects
c) continue stream rehabilitation programs to improve degraded fish habitat, with emphasis on headwater areas of streams; continue to develop practical expertise in habitat rehabilitation, including that for large rivers	Consider instream boulder placement, bank stabilization, riparian planting, livestock fencing
d) remove undesirable barriers to fish migration while maintaining sea lamprey control; prevent the construction of new dams	If dam removal is not feasible, encourage conversion to bottom-draw discharge to minimize warming of downstream water; consider modification to allow fish passage (i.e. install fishway) Most brown and rainbow trout are blocked from migration past the Old Mill Dam- additional angling opportunities would be provided if access beyond this point were considered

STRATEGY III) PROTECT EXISTING FISH STOCKS DURING VULNERABLE PERIODS SUCH AS MIGRATION, SPAWNING AND NURSERY STAGES

TACTICS	COMMENTS
a) identify migration routes, timing of spawning runs, spawning areas, and nursery habitats	
b) enforce existing fishing regulations; continue to identify and implement new measures required to protect fish populations	Designate fish sanctuaries if clearly required
c) direct the timing of development activities in and around water; instream work permitted according to the guidelines presented in Appendix 7 and figure 9 in order to protect the migratory corridor for salmonids, and the migratory corridor and production zones (spawning/nursery habitat) for warmwater species	In conjunction with Conservation Authorities and adjoining districts, amend construction timing guidelines as necessary, when new biological information becomes available; construction proposals in nearshore areas of Lake Ontario will be evaluated on a case-by-case basis; the migratory corridor for salmonids extends only up to the Old Mill Dam at this time; all of this subzone has been designated as a migratory corridor and/or production zone for warmwater species
d) ensure adherence to mitigation techniques during construction	
e) monitor and implement improvements in mitigation techniques on construction sites, i.e. apply best practicable technology	Input at plan review stage; monitor during implementation Use filter cloth, soil bioengineering techniques

STRATEGY IV) PARTITION MIGRATORY FROM RESIDENT POPULATIONS IN SPAWNING AND/OR NURSERY STREAMS, TO PREVENT OR MINIMIZE INTERSPECIFIC COMPETITION AND TO ENHANCE PRODUCTIVITY

TACTICS	COMMENTS
a) use existing dams and obstructions as barriers where required; employ fishways to selectively facilitate or restrict upstream access	e.g. Old Mill Dam is used as a lamprey barrier Rainbow trout will have access to potential production zones (e.g. between Woodbridge and Bolton); pacific salmon migration will be stopped lower in the watershed; no migratory salmonids will be allowed into the resident brook and brown trout zone.
b) construct new weirs or barriers as necessary to selectively restrict or facilitate fish migrations	

STRATEGY V) MAINTAIN THE GENETIC INTEGRITY OF EXISTING FISH POPULATIONS

TACTICS	COMMENTS
a) prevent the introduction of wild, domesticated and non-native fish stocks which would have a negative impact on native or naturalized fish populations	Enforcement of Ontario Fishing Regulations
b) identify fish stocks through tagging programs	Monitor put-and-delayed-take salmonid fishery, particularly brown trout; determine movements of stocked fish

STRATEGY VI) CONTROL EXPLOITATION RATES TO PREVENT OVER-HARVESTING OF FISH STOCKS

TACTICS	COMMENTS
a) continue to enforce existing creel limits and fishing seasons; investigate need for more enforcement personnel; prioritize enforcement effort	
b) increase public awareness and appreciation of special fisheries regulations	
c) evaluate the need for proposed and existing regulations based on biological merit and social, economic and ethical concerns; implement these as required	
d) redirect fishing effort to under-utilized waters and species	e.g. warmwater species such as pumpkinseed, chub, carp Prepare brochure to promote fishing for under-utilized species in district

STRATEGY VII) IMPROVE PUBLIC ACCESS TO FISHERIES

TACTICS	COMMENTS
a) develop an extension program involving private landowners, angler organizations and municipalities to improve angler awareness, enhance fishing access, and foster working relations amongst these groups	Prepare a brochure, with map, outlining angling access in Maple District Develop a mailing list of riparian landowners to inform them of fisheries management projects and programs
b) encourage individuals, organized user groups and municipalities to provide fishing access, or develop new public access points and facilities, through financial incentives and cost-sharing programs	Investigate where access is limiting and demand for fishing exists; support land easements and other negotiated agreements with private landowners
c) encourage land acquisition by other agencies (e.g. MTRCA) when fisheries will be a primary beneficiary	
d) promote awareness of urban fishing opportunities	Through the Urban Fishing Program (e.g. Metro Fishing Week); distribution of publications e.g. Toronto Angler's Guide Good angling opportunities exist near Old Mill, Humber Bay

STRATEGY VIII) SUPPLEMENT SELECTED FISH POPULATIONS WITH PLANTINGS OF HEALTHY FISH ACCORDING TO PROVINCIAL STANDARDS AND PROCEDURES

TACTICS	COMMENTS
a) use adult fish transfers where feasible to augment depleted populations or to facilitate range expansion	
b) continue plantings of hatchery-reared fish; review fish stocking targets regularly	Recognize limits to stocking imposed by availability of forage in Lake Ontario; continue to stock brown trout yearlings in the lower Humber River
c) ensure that hatchery fish of the appropriate size are distributed to good quality stocking sites during time when survival will be maximized	

STRATEGY IX) CONSIDER THE INTRODUCTION OF ADDITIONAL OR ALTERNATIVE FISH SPECIES WHERE SUCH AN INTRODUCTION WOULD NOT HAVE A SERIOUS IMPACT ON THE EXISTING DESIRABLE FISH POPULATION

TACTICS	COMMENTS
a) continue to investigate introductions of fish for urban fisheries	e.g. bullhead, northern pike, bass

STRATEGY X) ENCOURAGE THE HARVEST OF UNDER-UTILIZED SPECIES

TACTICS	COMMENTS
a) increase public awareness of under-utilized fish species such as bullhead, carp, sucker and pumpkinseed through an active education and promotional program, particularly in urban areas	Additional angler opportunities exist for warmwater game and non-game species; prepare brochure to promote fishing for under-utilized species in district

STRATEGY XI) IMPROVE FISHERIES IN SUITABLE BUT UNDER-UTILIZED HABITAT

TACTICS	COMMENTS
a) assess the need for stocking	
b) consider the removal of barriers to fish colonization	The Old Mill Dam and a series of weirs upstream block most migrating fish on the lower Humber River; fishways could provide access to potential production zones further upstream
c) investigate the introduction of largemouth or smallmouth bass into under-producing or urban waters not presently supporting a top predator	

STRATEGY XII) PROVIDE FISHING OPPORTUNITIES BY CREATING ARTIFICIAL PUT-AND-TAKE FISHERIES IN SELECTED WATERS TO SATISFY DEMAND OR DIVERT PRESSURE FROM RESIDENT FISH STOCKS

TACTICS	COMMENTS
a) investigate the need for put-and-take urban fisheries	
b) encourage the private sector to provide artificial fisheries on a "user pays" basis on private lakes and ponds	

STRATEGY XIII) ENCOURAGE PUBLIC PARTICIPATION IN THE MANAGEMENT OF LOCAL FISHERIES

TACTICS	COMMENTS
a) solicit public input and review of major management initiatives	Review of DFMP every 5 years; consultation for major experimental management proposals or special regulations
b) encourage cooperative projects with individual landowners, local angler clubs, interest groups	

STRATEGY XIV) DEVELOP A COMPREHENSIVE FISHERIES ASSESSMENT PROGRAM TO MONITOR FISH POPULATIONS AND HABITAT CONDITIONS

TACTICS	COMMENTS
a) develop an index program to monitor the status of local fish populations	Stream assessment crew to implement; refine potential yield estimates to ensure targets are reasonable

b) initiate aquatic habitat inventory (survey and habitat assessment components) on unsurveyed waters and waters subject to rapid land use changes; resurvey previously inventoried waters as required.	
c) develop and maintain creel survey programs to monitor demand and exploitation rates	In cooperation with LOFU
d) support, at the district level, the long-term studies of the Lake Ontario Fisheries Unit (under the direction of the Lake Ontario Management Committee) to ensure that fisheries management needs are met	Applies to angler surveys, lamprey monitoring, stocking assessment (e.g. growth, survival, diet) in the lower reaches of the river and river mouth
e) use results from specific fish community studies to direct fisheries management of similar communities	

STRATEGY XV) PROTECT AND MAINTAIN EXISTING BAITFISH POPULATIONS

TACTICS	COMMENTS
a) monitor trends in baitfish harvest through annual returns from commercial baitfish fishermen	Compare with current models for potential yield (Table 1) to ensure that local fish populations in heavily fished areas are not over-exploited
b) prevent over-harvest of baitfish populations	Limit entry to the fishery and restrict harvest where necessary, based on the results of monitoring (see Tactic (a) above) i.e. control number of catch licenses allowed in each baitfish management unit; adjust harvest by re-directing effort from over to under-utilized waters
c) continue to enforce existing regulations pertinent to the capture and sale of baitfish species, including those to prevent the introduction of competitive fish species and the spread of disease	Inform baitfish dealers of regulations pertaining to their operations; develop a communication package to educate anglers about regulations pertaining to the harvest of baitfish for personal use
d) prevent any baitfish species from local extinction, by controlling harvest and preventing habitat loss	Exclude baitfish harvest from areas inhabited by rare species, e.g. redside dace; advise baitfish fishermen about the status and distribution of rare, threatened or endangered species
e) develop education and extension programs as part of an integrated resource management approach to baitfish protection and rehabilitation	

STRATEGY XVI) INCREASE THE AVAILABILITY OF BAITFISH TO ANGLERS

TACTICS	COMMENTS
a) encourage the private aquaculture industry and baitfish fishermen to rear baitfish species (e.g. common white sucker) to reduce demand on natural populations	Provide technical advice and assistance; refer proponents to MOE for approval to remove and discharge water under the Ontario Water Resources Act

b) consider the introduction of suitable baitfish species to suitable waters

c) encourage local use of baitfish harvested in Maple District

STRATEGY XVII) DEVELOP A COMPREHENSIVE BAITFISH ASSESSMENT PROGRAM

TACTICS	COMMENTS
a) develop methodology for acquiring data on fishing effort by fishermen	
b) evaluate the potential for habitat improvement to increase baitfish yield of streams	
c) determine productivity and potential baitfish yields for local waters	Conduct assessment studies of representative waters once every five years
d) identify critical areas of baitfish habitat, in conjunction with other fish habitat mapping studies	

STRATEGY XVIII) DEVELOP A COMPREHENSIVE BAITFISH MANAGEMENT PROGRAM

TACTICS	COMMENTS
a) encourage baitfish dealers to submit accurate, detailed record of harvest and other licenced activities	Consider use of incentives, workshops; streamlined administrative procedures
b) maintain waiting lists for baitfish harvest licenses	Review and update every two years; re-allocate licenses that have been inactive for two years to people on the waiting list
d) encourage the establishment of a Maple District baitfish management council comprised of commercial baitfish fishermen	
e) investigate the implementation of the "exclusive-use block system" as the standard means of sharing baitfish among harvesters	

STRATEGY XIX) ACTIVELY PROMOTE NON-CONSUMPTIVE USES OF LOCAL AQUATIC RESOURCES

TACTICS	COMMENTS
a) develop extension and education programs	Issue news releases to inform the public of upcoming viewing events; prepare and update pamphlets listing and describing viewing opportunities particularly in urban areas e.g. sucker run at Old Mill Dam

b) develop fish viewing events and areas	Promote the establishment and preservation of streambank buffer zones for non-consumptive enjoyment of fisheries; install displays to improve public knowledge of the resource particularly in urban areas; improve public access to fish viewing areas; encourage incorporation of fish viewing facilities in new projects where feasible

STRATEGY XX) PREVENT THE EXTINCTION OF RARE, THREATENED AND ENDANGERED SPECIES

TACTICS	COMMENTS
a) establish the distribution and habitat requirements of these species (e.g. redside dace, Lake Simcoe whitefish stock) in Maple District	Through the aquatic habitat inventory program; redside dace occur in the West and East Humber Rivers
b) protect areas inhabited by these species from the impacts of development and fishing	Part of plan input and review process and baitfish management program
c) rehabilitate degraded fish habitat	
d) maintain public awareness of rare, threatened and endangered species	Advise baitfish fishermen about the status and distribution of these species
(e) augment declining populations where feasible, by culture	

SMALL PEEL PLAIN RIVERS ZONE

This zone includes Etobicoke Creek, Mimico Creek, the Don River, Highland Creek, Petticoat Creek, Carruthers Creek and other small warmwater streams in the Lake Ontario drainage of Maple District. These waters are generally degraded by urban land use, but may support small warmwater fisheries. Drainage areas (km^2) are: Etobicoke Creek 207; Mimico 28; Don 360; Highland Creek 107; Petticoat Creek 26; Carruthers Creek 40. Land use is primarily urban, industrial or residential, with agricultural land in the upper portions of Etobicoke Creek, the Don River, Petticoat Creek and Carruthers Creek. These streams arise on the Till or Peel Plains, and are major pathways for urban stormwater drainage into Lake Ontario.

The detailed strategies and tactics in the following table deal with fisheries management issues on the small Peel Plain Rivers. Objectives in this management zone are:

- cooperate with other agencies to address water quality problems and actively participate in the preparation and implementation of a Remedial Action Plan for the Metro Toronto waterfront

- increase public awareness and education about urban fisheries

- improve access for anglers as warranted


SMALL PEEL PLAIN RIVERS ZONE
RICHMOND HILL
MARKHAM
VAUGHAN
PICKERING
CALEDON
BRAMPTON
NORTH YORK
SCARBOROUGH
YORK
ETOBICOKE
EAST YORK
MISSISSAUGA
LEGEND
WATERSHED BOUNDARY
HIGHWAYS
URBAN AREA
TOWNSHIP BOUNDARY
METROPOLITAN TORONTO BOUNDARY
DAM

3. SMALL PEEL PLAIN RIVERS MANAGEMENT ZONE: INCLUDES ETOBICOKE CREEK, MIMICO CREEK, DON RIVER, HIGHLAND CREEK, PETTICOAT CREEK, CARRUTHERS CREEK AND OTHER SMALL WARMWATER STREAMS IN THE LAKE ONTARIO DRAINAGE OF MAPLE DISTRICT. THESE STREAMS ARE GENERALLY DEGRADED BY URBAN USE, BUT MAY SUPPORT SMALL WARMWATER FISHERIES, AND MAY ATTRACT SMALL NUMBERS OF LAKE-RUN SALMONIDS.

STRATEGY I) PROTECT FISHERIES HABITAT BY MINIMIZING THE EFFECTS OF DEVELOPMENT HABITAT

TACTICS	COMMENTS
a) identify sensitive areas, including groundwater sources, spawning and nursery habitats, through inventory and habitat assessment programs	In addition to a field crew for stream assessment, use aerial photography, thermal mapping, video cameras
b) enforce existing legislation pertaining to fish habitat protection	
c) implement the federal Department of Fisheries and Oceans policy for the management of fish habitat, including the principle of **no net loss of fish habitat** (Appendix 6)	New initiative. Strive to balance unavoidable habitat losses with habitat replacement on a project-by-project basis
d) liaise with MTRCA and other municipal, provincial, federal agencies (e.g. DOE, OMOE, OMAF, Ontario Hydro) to ensure that sensitive habitat is identified and protected; recognize fisheries, where appropriate, as the most sensitive use; continue municipal plan input and review	
e) implement wetland management policy that will protect headwater, riverine and estuarine wetlands; evaluate the fisheries significance of the wetlands in Maple District; consider valuable wetlands in the plan input and review process; inform private landowners about valuable wetlands on or adjacent to their property, and the importance of those wetlands to fisheries and water management	Wetlands associated with this zone were classified under the OWES as follows: Shoal Point Marsh (3), Carruthers Creek Marsh (3), Townline Swamp (3), Amos Ponds (5), Highland Creek (6)
f) minimize stream bank and shoreline disturbance during development; demarcate and protect natural vegetation during and after construction activities	Considered on a case by case basis as part of plan input and review process. Apply vegetative buffer zone guidelines as presented in Appendix 5. Provide copies of the guidelines to all parties involved.
g) review water management schemes impacting fisheries (e.g. hydro power projects, withdrawals for irrigation or industry, groundwater withdrawals)	Consider development of an information package to inform landowners with existing onstream ponds or dams regarding proper water management techniques (e.g. avoid drawdown during fish spawning or egg incubation) Negotiate suitable draw and fill schedules for G. Ross Lord Reservoir with MTRCA

h) require erosion and sediment controls during and after construction, including site rehabilitation as soon after construction as possible, to reduce siltation of receiving waters	Part of plan input and review process; liaise with OMOE, Conservation Authorities, municipalities Encourage use of filter cloth, rapid revegetation techniques (soil bioengineering) Increase compliance monitoring and enforcement
i) discourage dredging and channelization when alternate methods of channel management exist; where channelization is unavoidable, natural channel features are to be incorporated, and passage for fish migration provided where appropriate	Part of plan input and review process; liaise with OMOE, Conservation Authorities, municipalities; increase compliance monitoring and enforcement
j) prohibit direct inflow of untreated stormwater into watercourses	Part of plan input and review process; liaise with OMOE, Conservation Authorities; increase compliance monitoring and enforcement Ensure that stormwater treatment and urban runoff controls reflect current technology, e.g. source control of stormwater, retention/detention facilities, landscape design; require that sediment control ponds be designed to detain at least 125 m^3/ha runoff from the development for at least 12 hours, or be capable of removing particle sizes down to 40 microns (interim guidelines based on a compromise between pond size and cost, and effectiveness of sediment and nutrient removal, Peter White, pers. comm.)
k) work with municipalities to encourage the maintenance and upkeep of stormwater control structures and stream bank stabilization projects	e.g. retention ponds
l) develop education and extension programs to improve public, corporate and governmental understanding of integrated resource management and the ecosystem approach to fisheries protection and rehabilitation; ensure recognition of the biological and socio-economic benefits of healthy fisheries	Resource Education Kit is now available; intended to develop appreciation and understanding of natural resource management at the primary school level Development of a Mitigation Education Program proposed to explain use of landscape ecology and soil bioengineering to mitigate impacts on aquatic ecosystems as a result of development Prepare a guide that illustrates how urban fisheries habitat requirements/fishing access can be incorporated into development proposals Consider organizing an annual Fisheries Science Education Day to update key agencies on new techniques, current projects
m) prohibit the construction of onstream ponds	

STRATEGY II) REHABILITATE DEGRADED FISH HABITAT, WARMWATER FISHERIES

TACTICS	COMMENTS
a) encourage rehabilitation projects on warmwater streams with CA's, municipalities, local angler clubs, interest groups, scientific associations and universities, individual landowners and other government agencies (e.g. OMAF, OMOE)	Implement joint rehabilitation projects with these agencies; support participation in CFIP, COFAP programs; recognize efforts of groups such as Save The Rouge and the Black Creek Project in improving degraded streams
b) establish a priority system for habitat rehabilitation projects on warmwater streams	
c) develop practical expertise in habitat rehabilitation in urbanized streams	
d) remove undesirable barriers to fish migration while maintaining sea lamprey control; prevent the construction of new dams	If dam removal is not feasible, encourage conversion to bottom-draw discharge to minimize warming of downstream water; consider modification to allow fish passage (i.e. install fishway) Ensure minimum water depths are maintained for fish passage e.g. culverts should be continuous, installed below minimum water level to allow fish passage throughout the year

STRATEGY III) PROTECT EXISTING FISH STOCKS DURING VULNERABLE PERIODS SUCH AS MIGRATION, SPAWNING AND NURSERY STAGES

TACTICS	COMMENTS
a) identify migration routes, timing of spawning runs, spawning areas, and nursery habitats	
b) enforce existing fishing regulations	
c) direct the timing of development activities in and around water; instream work permitted according to the guidelines presented in Appendix 7 and figure 9 in order to protect migratory corridors and production zones (spawning/nursery habitat) for warmwater species	In conjunction with Conservation Authorities and adjoining districts, amend construction timing guidelines as necessary, when new biological information becomes available
d) ensure adherence to mitigation techniques during construction	
e) monitor and implement improvements in mitigation techniques on construction sites, i.e. apply best practicable technology	Input at plan review stage; monitor during implementation Use filter cloth, soil bioengineering techniques

STRATEGY IV) IMPROVE PUBLIC ACCESS TO FISHERIES

TACTICS	COMMENTS
a) develop an extension program involving private landowners, angler organizations and municipalities to improve angler awareness, enhance fishing access, and foster working relations amongst these groups	Prepare a brochure, with map, outlining angling access in Maple District Develop a mailing list of riparian landowners to inform them of fisheries management projects and programs
b) encourage individuals, organized user groups and municipalities to provide fishing access, or develop new public access points and facilities, through financial incentives and cost-sharing programs	Investigate where access is limiting and demand for fishing exists; support land easements and other negotiated agreements with private landowners
c) encourage land acquisition by other agencies when fisheries will be a primary beneficiary	
d) promote awareness of urban fisheries	

STRATEGY V) SUPPLEMENT SELECTED FISH POPULATIONS WITH PLANTINGS OF HEALTHY FISH ACCORDING TO PROVINCIAL STANDARDS AND PROCEDURES

TACTICS	COMMENTS
a) use adult fish transfers where feasible to augment depleted populations or facilitate range expansion	

STRATEGY VI) CONSIDER THE INTRODUCTION OF ADDITIONAL OR ALTERNATIVE FISH SPECIES WHERE SUCH AN INTRODUCTION WOULD NOT HAVE A SERIOUS IMPACT ON THE EXISTING DESIRABLE FISH POPULATION

TACTICS	COMMENTS
a) continue to investigate introductions of fish for urban fisheries	e.g. bullhead, northern pike, bass

STRATEGY VII) ENCOURAGE THE HARVEST OF UNDER-UTILIZED SPECIES

TACTICS	COMMENTS
a) increase public awareness of under-utilized and/or over-abundant fish species such as bullhead, carp, sucker and pumpkinseed through an active education and promotional program, particularly in urban areas	Prepare brochure to promote fishing for under-utilized species in district

STRATEGY VIII) IMPROVE FISHERIES IN SUITABLE BUT UNDER-UTILIZED HABITAT

TACTICS	COMMENTS
a) assess the need for stocking	Off-channel habitats such as permanent stormwater retention ponds may provide suitable habitat for bullhead and largemouth bass in urban drainages
b) consider the removal of barriers to fish colonization	
c) investigate the introduction of largemouth or smallmouth bass into under-producing or urban waters not presently supporting a top predator	e.g. G. Ross Lord Reservoir

STRATEGY IX) ENCOURAGE PUBLIC PARTICIPATION IN THE MANAGEMENT OF LOCAL FISHERIES

TACTICS	COMMENTS
a) solicit public input and review of major management initiatives	Review of DFMP every 5 years; consultation for major experimental management proposals or special regulations
b) encourage cooperative projects with individual landowners, local angler clubs, interest groups	

STRATEGY X) DEVELOP A COMPREHENSIVE FISHERIES ASSESSMENT PROGRAM TO MONITOR FISH POPULATIONS AND HABITAT CONDITIONS

TACTICS	COMMENTS
a) develop an index program to monitor the status of local fish populations	Stream assessment crew to implement; refine potential yield estimates to ensure targets are reasonable
b) initiate aquatic habitat inventory (survey and habitat assessment components) on unsurveyed waters and waters subject to rapid land use changes; resurvey previously inventoried waters as required.	Resurvey in 1989
c) develop and maintain creel survey programs to monitor demand and exploitation rates	Assess increase in fishing due to Urban Fishing Program
d) use results from specific fish community studies to direct fisheries management of similar communities	

STRATEGY XI) PROTECT AND MAINTAIN EXISTING BAITFISH POPULATIONS

TACTICS	COMMENTS
a) monitor trends in baitfish harvest through annual returns from commercial baitfish fishermen	Compare with current models for potential yield (Table 1) to ensure that local fish populations in heavily fished areas are not over-exploited

b) prevent over-harvest of baitfish populations	Limit entry to the fishery and restrict harvest where necessary, based on the results of monitoring (see Tactic (a) above) i.e. control number of catch licenses allowed in each baitfish management unit; adjust harvest by re-directing effort from over to under-utilized waters
c) continue to enforce existing regulations pertinent to the capture and sale of baitfish species, including those to prevent the introduction of competitive fish species and the spread of disease	Inform baitfish dealers of regulations pertaining to their operations; develop a communication package to educate anglers about regulations pertaining to the harvest of baitfish for personal use
d) prevent any baitfish species from local extinction, by controlling harvest and preventing habitat loss	Exclude baitfish harvest from areas inhabited by rare species, e.g. redside dace; advise baitfish fishermen about the status and distribution of rare, threatened or endangered species
e) develop education and extension programs as part of an integrated resource management approach to baitfish protection and rehabilitation	

STRATEGY XII) INCREASE THE AVAILABILITY OF BAITFISH TO ANGLERS

TACTICS	COMMENTS
a) encourage the private aquaculture industry and baitfish fishermen to rear baitfish species (e.g. common white sucker) to reduce demand on natural populations	Provide technical advice and assistance; refer proponents to MOE for approval to remove and discharge water under the Ontario Water Resources Act
b) consider the introduction of suitable baitfish species to suitable waters	
c) encourage local use of baitfish harvested in Maple District	

STRATEGY XIII) DEVELOP A COMPREHENSIVE BAITFISH ASSESSMENT PROGRAM

TACTICS	COMMENTS
a) develop methodology for acquiring data on fishing effort by fishermen	
b) evaluate the potential for habitat improvement to increase baitfish yield of streams	
c) determine productivity and allowable baitfish yields for local waters	Conduct assessment studies of representative waters once every five years
d) identify critical areas of baitfish habitat, in conjunction with other fish habitat mapping studies	

STRATEGY XIV) DEVELOP A COMPREHENSIVE BAITFISH MANAGEMENT PROGRAM

TACTICS	COMMENTS
a) encourage baitfish dealers to submit accurate, detailed record of harvest and other licenced activities	Consider use of incentives, workshops; streamlined administrative procedures
b) maintain waiting lists for baitfish harvest licenses	Review and update every two years; re-allocate licenses that have been inactive for two years to people on the waiting list
d) encourage the establishment of a Maple District baitfish management council comprised of commercial baitfish fishermen	
e) investigate the implementation of the "exclusive-use block system" as the standard means of sharing baitfish among harvesters	

STRATEGY XV) PREVENT THE EXTINCTION OF RARE, THREATENED AND ENDANGERED SPECIES

TACTICS	COMMENTS
a) establish the distribution and habitat requirements of these species (e.g. redside dace, Lake Simcoe whitefish stock) in Maple District	Through the aquatic habitat inventory program; redside dace occur in the headwaters of the Little Don River
b) protect areas inhabited by these species from the impacts of development and fishing	Part of plan input and review process and baitfish management program
c) rehabilitate degraded fish habitat	
d) maintain public awareness of rare, threatened and endangered species	Advise baitfish fishermen about the status and distribution of these species
(e) augment declining populations where feasible, by culture	

ROUGE RIVER MANAGEMENT ZONE

The Rouge River flows into Lake Ontario at Scarborough, and drains an area of 327 km². Major tributaries are the Rouge River (or west branch) and the Little Rouge River (or east branch). Land use in the basin is primarily agricultural, with large urban centres around Whitchurch-Stouffville, Markham and Scarborough. Headwater tributaries arise in the interlobate moraine.

The detailed strategies and tactics in the following table deal with fisheries management issues on the Rouge River. Objectives in this management zone are:

- protect sensitive portions of the watershed, particularly in the headwater tributaries, from the effects of urban development on fish habitat and water quality; rehabilitate any degraded sections

- cooperate with other agencies to address water quality problems

- evaluate the impact of on-stream dams and ponds on fisheries

- investigate the feasibility of rehabilitation of the middle reaches of the Rouge and Little Rouge River for resident cool water trout utilization; and the provision of fish passage of migratory brown/rainbow trout at the Milne Dam and Toogood Pond in Markham, the IBM Dam at Steeles and the Park Dam at the Pickering Town limit

- continue to develop a migratory salmonid fishery throughout the lower river by stocking rainbow trout and brown trout

- consider the rehabilitation necessary to achieve a self-sustaining rainbow trout population in the lower reaches of the Rouge River; consider migratory salmon utilization in the lower reaches

- preserve and enhance the warmwater community in the Delta Marsh (smallmouth, largemouth bass and pike)

- improve access to migratory salmonid and warmwater fisheries in the lower reaches

- encourage continued support for the protection and rehabilitation of fisheries and fish habitat by municipalities and interest groups

- increase public awareness and education about urban fisheries

ROUGE RIVER MANAGEMENT ZONE

4. ROUGE RIVER MANAGEMENT ZONE: THIS ZONE IS USED PRIMARILY FOR WARMWATER FISHERIES AND FOR A MIGRATORY SALMONID FISHERY IN THE LOWER REACHES. SOME HEADWATER STREAMS SUPPORT A BROOK TROUT FISHERY.

STRATEGY I) PROTECT FISHERIES HABITAT BY MINIMIZING THE EFFECTS OF DEVELOPMENT, WITH EMPHASIS ON HEADWATER AND OTHER BIOLOGICALLY SIGNIFICANT HABITAT

TACTICS	COMMENTS
a) identify sensitive areas, including groundwater sources, spawning and nursery habitats, through inventory and habitat assessment programs	In addition to a field crew for stream assessment, use aerial photography, thermal mapping, video cameras
b) enforce existing legislation pertaining to fish habitat protection	
c) implement the federal Department of Fisheries and Oceans policy for the management of fish habitat, including the principle of **no net loss of fish habitat** (Appendix 6)	New initiative. Strive to balance unavoidable habitat losses with habitat replacement on a project-by-project basis
d) liaise with MTRCA and other municipal, provincial, federal agencies (e.g. DOE, OMOE, OMAF, Ontario Hydro) to ensure that sensitive habitat is identified and protected; recognize fisheries, where appropriate, as the most sensitive use; continue municipal plan input and review	
e) implement wetland management policy that will protect headwater, riverine and estuarine wetlands; evaluate the fisheries significance of the wetlands in Maple District; consider valuable wetlands in the plan input and review process; inform private landowners about valuable wetlands on or adjacent to their property, and the importance of those wetlands to fisheries and water management	Wetlands associated with this zone were classified under the OWES as follows: Rouge River Marsh (2), Unionville Marsh (3), Bloomington (3), Jefferson Swamp (7), Simeon Lake Forest Complex (7), White Rose Complex (7)
f) minimize stream bank and shoreline disturbance during development; demarcate and protect natural vegetation during and after construction activities	Considered on a case by case basis as part of plan input and review process. Apply vegetative buffer zone guidelines as presented in Appendix 5. Provide copies of the guidelines to all parties involved.
g) review water management schemes impacting fisheries (e.g. hydro power projects, withdrawals for irrigation or industry, groundwater withdrawals)	Consider development of an information package to inform landowners with existing onstream ponds or dams regarding proper water management techniques (e.g. avoid drawdown during fish spawning or egg incubation) Negotiate a suitable draw and fill schedule for the Milne and Stouffville Reservoirs to protect fish spawning and migration

h) require erosion and sediment controls during and after construction, including site rehabilitation as soon after construction as possible, to reduce siltation of receiving waters	Part of plan input and review process; liaise with OMOE, Conservation Authorities, municipalities Encourage use of filter cloth, rapid revegetation techniques (soil bioengineering) Increase compliance monitoring and enforcement
i) discourage dredging and channelization when alternate methods of channel management exist; where channelization is unavoidable, natural channel features are to be incorporated, and passage for fish migration provided where appropriate	Part of plan input and review process; liaise with OMOE, Conservation Authorities, municipalities; increase compliance monitoring and enforcement Discourage dredging and channelization on the Little Rouge River and above 16th Ave. on the main Rouge River
j) prohibit direct inflow of untreated stormwater into watercourses	Part of plan input and review process; liaise with OMOE, Conservation Authorities; increase compliance monitoring and enforcement Ensure that stormwater treatment and urban runoff controls reflect current technology, e.g. source control of stormwater, retention/detention facilities, landscape design; require that sediment control ponds be designed to detain at least 125 m^3/ha runoff from the development for at least 12 hours, or be capable of removing particle sizes down to 40 microns (interim guidelines based on a compromise between pond size and cost, and effectiveness of sediment and nutrient removal, Peter White, pers. comm.)
k) work with municipalities to encourage the maintenance and upkeep of stormwater control structures and stream bank stabilization projects	e.g. retention ponds
l) develop education and extension programs to improve public, corporate and governmental understanding of integrated resource management and the ecosystem approach to fisheries protection and rehabilitation; ensure recognition of the biological and socio-economic benefits of healthy fisheries	Resource Education Kit is now available; intended to develop appreciation and understanding of natural resource management at the primary school level Development of a Mitigation Education Program proposed to explain use of landscape ecology and soil bioengineering to mitigate impacts on aquatic ecosystems as a result of development Prepare a guide that illustrates how urban fisheries habitat requirements/fishing access can be incorporated into development proposals Consider organizing an annual Fisheries Science Education Day to update key agencies on new techniques, current projects
m) prohibit the construction of onstream ponds	

STRATEGY II) REHABILITATE DEGRADED FISH HABITAT, WITH AN EMPHASIS ON SENSITIVE COLDWATER SYSTEMS ALONG THE OAK RIDGES MORAINE; REHABILITATE WARMWATER FISHERIES

TACTICS	COMMENTS
a) maintain established cooperative rehabilitation projects, and encourage new projects with CA's, municipalities, local angler clubs, interest groups, scientific associations and universities, individual landowners and other government agencies (e.g. OMAF, OMOE)	Implement joint rehabilitation projects with these agencies; support participation in CFIP, COFAP programs; support Save The Rouge's efforts to revegetate riparian areas
b) establish a priority system for habitat rehabilitation projects	Starting in 1988, develop a five year plan in conjunction with MTRCA to prioritize rehabilitation projects
c) continue stream rehabilitation programs to improve degraded fish habitat, with emphasis on headwater areas of streams; continue to develop practical expertise in habitat rehabilitation	Consider instream boulder placement, bank stabilization, riparian planting, livestock fencing
d) remove undesirable barriers to fish migration while maintaining sea lamprey control; prevent the construction of new dams	If dam removal is not feasible, encourage conversion to bottom-draw discharge to minimize warming of downstream water; consider modification to allow fish passage (i.e. install fishway) e.g. Milne and Toogood Dams

STRATEGY III) PROTECT EXISTING FISH STOCKS DURING VULNERABLE PERIODS SUCH AS MIGRATION, SPAWNING AND NURSERY STAGES

TACTICS	COMMENTS
a) identify migration routes, timing of spawning runs, spawning areas, and nursery habitats	
b) enforce existing fishing regulations; continue to identify and implement new measures required to protect fish populations	

c) direct the timing of development activities in and around water; instream work permitted according to the guidelines presented in Appendix 7 and figure 9 in order to protect the migratory corridor for salmonids, production zones (spawning/nursery habitat) for migratory salmonids, production zones for resident salmonids, and migratory corridors and production zones for warmwater species	In conjunction with Conservation Authorities and adjoining districts, amend construction timing guidelines as necessary, when new biological information becomes available; construction proposals in nearshore areas of Lake Ontario will be evaluated on case-by-case basis; section from the mouth to approx. Hwy 401 has been designated as a migratory corridor for salmonids (rainbow trout, Pacific salmon, brown trout); a potential production zone for migratory salmonids (rainbow trout) has been identified between Hwy 401 and the Milne Dam (Hwy 7) on the main river and approx. Steeles Ave. on Little Rouge Ck.; productions zone for resident salmonids (brook trout) occur in some of the headwater tributaries of the Rouge R. and Little Rouge Ck. (see Fisheries Resource Maps and Figure 3), particularly in the vicinity of Ringwood; with the exception of these headwater areas, all of this subzone has also been designated as a migratory corridor and/or production zone for warmwater species
d) ensure adherence to mitigation techniques during construction	
e) monitor and implement improvements in mitigation techniques on construction sites, i.e. apply best practicable technology	Input at plan review stage; monitor during implementation Use filter cloth, soil bioengineering techniques

STRATEGY IV) MAINTAIN THE GENETIC INTEGRITY OF EXISTING FISH POPULATIONS

TACTICS	COMMENTS
a)-prevent the introduction of wild, domesticated and non-native fish stocks which would have a negative impact on native or naturalized fish populations	Enforcement of Ontario Fishing Regulations

STRATEGY V) CONTROL EXPLOITATION RATES TO PREVENT OVER-HARVESTING OF FISH STOCKS

TACTICS	COMMENTS
a) continue to enforce existing creel limits and fishing seasons; investigate need for more enforcement personnel; prioritize enforcement effort	
b) increase public awareness and appreciation of special fisheries regulations	
c) evaluate the need for proposed and existing regulations based on biological merit and social, economic and ethical concerns; implement these as required	

d) redirect fishing effort to under-utilized waters and species	e.g. Milne Reservoir Prepare brochure to promote fishing for under-utilized species in district

STRATEGY VI) IMPROVE PUBLIC ACCESS TO FISHERIES

TACTICS	COMMENTS
a) develop an extension program involving private landowners, angler organizations and municipalities to improve angler awareness, enhance fishing access, and foster working relations amongst these groups	Prepare a brochure, with map, outlining angling access in Maple District Develop a mailing list of riparian landowners to inform them of fisheries management projects and programs Address angler trespassing problem on the lower Rouge River
b) encourage individuals, organized user groups and municipalities to provide fishing access, or develop new public access points and facilities, through financial incentives and cost-sharing programs	Investigate where access is limiting and demand for fishing exists; support land easements and other negotiated agreements with private landowners Construct a fishing platform at the mouth of the Rouge River, in association with MTRCA and Metro Parks
c) encourage land acquisition by other agencies (e.g. MTRCA) when fisheries will be a primary beneficiary	
d) promote awareness of urban fishing opportunities	Through the Urban Fishing Program (e.g. Metro Fishing Week); distribution of publications e.g. Toronto Angler's Guide Construct display units at popular fishing areas such as the one in place at the Rouge Marsh

STRATEGY VII) SUPPLEMENT SELECTED FISH POPULATIONS WITH PLANTINGS OF HEALTHY FISH ACCORDING TO PROVINCIAL STANDARDS AND PROCEDURES

TACTICS	COMMENTS
a) use adult fish transfers where feasible to augment depleted populations or to facilitate range expansion	Expand distribution of smallmouth and largemouth bass, pike where possible
b) investigate the applicability of artificial rearing techniques and mini-hatchery projects initiated under CFIP	

c) continue plantings of hatchery-reared fish; review fish stocking targets regularly	Recognize limits to stocking imposed by availability of forage in Lake Ontario; continue to stock rainbow trout and brown trout yearlings in the lower Rouge River; review implications of stocking Pacific salmon
d) ensure that hatchery fish of the appropriate size are distributed to good quality stocking sites during time when survival will be maximized	

STRATEGY VIII) ENCOURAGE THE HARVEST OF UNDER-UTILIZED SPECIES

TACTICS	COMMENTS
a) increase public awareness of under-utilized fish species such as bullhead, carp, sucker and pumpkinseed through an active education and promotional program, particularly in urban areas	Additional angler opportunities exist for warmwater game and non-game species; prepare brochure to promote fishing for under-utilized species in district

STRATEGY IX) IMPROVE FISHERIES IN SUITABLE BUT UNDER-UTILIZED HABITAT

TACTICS	COMMENTS
a) assess the need for stocking	
b) consider the removal of barriers to fish colonization	Investigate feasibility of fish passes at Milne Dam in Markham, Toogood Dam at Unionville, Park Dam at Pickering Town limit, IBM Dam at Steeles Ave.; provide viewing opportunities where possible
c) investigate the introduction of largemouth or smallmouth bass into under-producing or urban waters not presently supporting a top predator	

STRATEGY X) PROVIDE FISHING OPPORTUNITIES BY CREATING ARTIFICIAL PUT-AND-TAKE FISHERIES IN SELECTED WATERS TO SATISFY DEMAND OR DIVERT PRESSURE FROM RESIDENT FISH STOCKS

TACTICS	COMMENTS
a) investigate the options for put-and-take urban fisheries in stormwater detention ponds	
b) encourage the private sector to provide artificial fisheries on a "user pays" basis on private lakes and ponds	
c) purchase disease-free fish from private hatcheries to plant in public waters	

STRATEGY XI) ENCOURAGE PUBLIC PARTICIPATION IN THE MANAGEMENT OF LOCAL FISHERIES

TACTICS	COMMENTS
a) solicit public input and review of major management initiatives	Review of DFMP every 5 years; consultation for major experimental management proposals or special regulations
b) encourage cooperative projects with individual landowners, local angler clubs, interest groups	Develop and maintain a list of candidate projects

STRATEGY XII) DEVELOP A COMPREHENSIVE FISHERIES ASSESSMENT PROGRAM TO MONITOR FISH POPULATIONS AND HABITAT CONDITIONS

TACTICS	COMMENTS
a) develop an index program to monitor the status of local fish populations	Stream assessment crew to implement; determine rainbow trout spawning success; conduct stocking assessment studies; refine potential yield estimates to ensure targets are reasonable
b) initiate aquatic habitat inventory (survey and habitat assessment components) on unsurveyed waters and waters subject to rapid land use changes; resurvey previously inventoried waters as required.	Resurvey in 1990
c) develop and maintain creel survey programs to monitor demand and exploitation rates	In cooperation with LOFU at the mouth of the Rouge River
d) use results from specific fish community studies to direct fisheries management of similar communities	

STRATEGY XIII) PROTECT AND MAINTAIN EXISTING BAITFISH POPULATIONS

TACTICS	COMMENTS
a) monitor trends in baitfish harvest through annual returns from commercial baitfish fishermen	Compare with current models for potential yield (Table 1) to ensure that local fish populations in heavily fished areas are not over-exploited
b) prevent over-harvest of baitfish populations	Limit entry to the fishery and restrict harvest where necessary, based on the results of monitoring (see Tactic (a) above) i.e. control number of catch licenses allowed in each baitfish management unit; adjust harvest by re-directing effort from over to under-utilized waters
c) continue to enforce existing regulations pertinent to the capture and sale of baitfish species, including those to prevent the introduction of competitive fish species and the spread of disease	Inform baitfish dealers of regulations pertaining to their operations; develop a communication package to educate anglers about regulations pertaining to the harvest of baitfish for personal use

d) prevent any baitfish species from local extinction, by controlling harvest and preventing habitat loss	Exclude baitfish harvest from areas inhabited by rare species, e.g. redside dace; advise baitfish fishermen about the status and distribution of rare, threatened or endangered species
e) develop education and extension programs as part of an integrated resource management approach to baitfish protection and rehabilitation	

STRATEGY XIV) INCREASE THE AVAILABILITY OF BAITFISH TO ANGLERS

TACTICS	COMMENTS
a) encourage the private aquaculture industry and baitfish fishermen to rear baitfish species (e.g. common white sucker) to reduce demand on natural populations	Provide technical advice and assistance; refer proponents to MOE for approval to remove and discharge water under the Ontario Water Resources Act
b) consider the introduction of suitable baitfish species to suitable waters	
c) encourage local use of baitfish harvested in Maple District	

STRATEGY XV) DEVELOP A COMPREHENSIVE BAITFISH ASSESSMENT PROGRAM

TACTICS	COMMENTS
a) develop methodology for acquiring data on fishing effort by fishermen	
b) evaluate the potential for habitat improvement to increase baitfish yield of streams	
c) determine productivity and allowable baitfish yields for local waters	Conduct assessment studies of representative waters once every five years
d) identify critical areas of baitfish habitat, in conjunction with other fish habitat mapping studies	

STRATEGY XVI) DEVELOP A COMPREHENSIVE BAITFISH MANAGEMENT PROGRAM

TACTICS	COMMENTS
a) encourage baitfish dealers to submit accurate, detailed record of harvest and other licenced activities	Consider use of incentives, workshops; streamlined administrative procedures
b) maintain waiting lists for baitfish harvest licenses	Review and update every two years; re-allocate licenses that have been inactive for two years to people on the waiting list

c) encourage the establishment of a Maple District baitfish management council comprised of commercial baitfish fishermen

d) investigate the implementation of the "exclusive-use block system" as the standard means of sharing baitfish among harvesters

STRATEGY XVII) ACTIVELY PROMOTE NON-CONSUMPTIVE USES OF LOCAL AQUATIC RESOURCES

TACTICS	COMMENTS
a) develop extension and education programs	Issue news releases to inform the public of upcoming viewing events; prepare and update pamphlets listing and describing viewing opportunities particularly in urban areas
b) develop fish viewing events and areas	Promote the establishment and preservation of streambank buffer zones for non-consumptive enjoyment of fisheries; install displays to improve public knowledge of the resource particularly in urban areas; improve public access to fish viewing areas; encourage incorporation of fish viewing facilities in new projects where feasible

STRATEGY XVIII) PREVENT THE EXTINCTION OF RARE, THREATENED AND ENDANGERED SPECIES

TACTICS	COMMENTS
a) establish the distribution and habitat requirements of these species (e.g. redside dace, Lake Simcoe whitefish stock) in Maple District	Through the aquatic habitat inventory program; redside dace occur in the headwaters of the Little Rouge River, main Rouge River, lower Rouge River
b) protect areas inhabited by these species from the impacts of development and fishing	Part of plan input and review process and baitfish management program
c) rehabilitate degraded fish habitat	
d) maintain public awareness of rare, threatened and endangered species	Advise baitfish fishermen about the status and distribution of these species
(e) augment declining populations where feasible, by culture	

DUFFINS CREEK MANAGEMENT ZONE

Duffins Creek flows into Lake Ontario at Ajax, and drains an area of 294 km^2. Major tributaries are West Duffins Creek and Duffins Creek (or east branch). Land use in the basin is primarily agricultural, pasture and forest, with some urbanization around Whitchurch-Stouffville, Pickering and Ajax. Duffins Creek arises in the interlobate moraine.

The detailed strategies and tactics in the following table deal with fisheries management issues on Duffins Creek. Objectives in this management zone are:

- protect sensitive portions of the stream from the effects of urban development on fish habitat and water quality, particularly cold headwater tributaries supporting resident brook trout populations
- determine extent of successful natural reproduction by migratory salmonids and adjust stocking levels accordingly
- assess current use of fishery
- implement and maintain effective habitat rehabilitation works
- continue rehabilitation stocking of brook trout; monitor success
- improve access to migratory salmonid fishery on lower reaches
- modify on-stream dams in the upper reaches to include bottom-draw
- assess feasibility of introducing resident brown trout into suitable sections of upper Duffins Creek

DUFFINS CREEK MANAGEMENT ZONE

5. DUFFINS CREEK MANAGEMENT ZONE: THIS ZONE IS USED PRIMARILY FOR RESIDENT BROOK AND BROWN TROUT IN THE HEADWATERS, AND FOR MIGRATORY SALMONID FISHERIES BELOW HIGHWAY 7.

STRATEGY I) PROTECT FISHERIES HABITAT BY MINIMIZING THE EFFECTS OF DEVELOPMENT, WITH EMPHASIS ON HEADWATER AND OTHER BIOLOGICALLY SIGNIFICANT HABITAT

TACTICS	COMMENTS
a) identify sensitive areas, including groundwater sources, spawning and nursery habitats, through inventory and habitat assessment programs	In addition to a field crew for stream assessment, use aerial photography, thermal mapping, video cameras
b) enforce existing legislation pertaining to fish habitat protection	
c) implement the federal Department of Fisheries and Oceans policy for the management of fish habitat, including the principle of **no net loss of fish habitat** (Appendix 6)	New initiative. Strive to balance unavoidable habitat losses with habitat replacement on a project-by-project basis
d) liaise with MTRCA and other municipal, provincial, federal agencies (e.g. DOE, OMOE, OMAF, Ontario Hydro) to ensure that sensitive habitat is identified and protected; recognize fisheries, where appropriate, as the most sensitive use; continue municipal plan input and review	
e) implement wetland management policy that will protect headwater, riverine and estuarine wetlands; evaluate the fisheries significance of the wetlands in Maple District; consider valuable wetlands in the plan input and review process; inform private landowners about valuable wetlands on or adjacent to their property, and the importance of those wetlands to fisheries and water management	Wetlands associated with this zone were classified under the OWES as follows: Duffins Creek Marsh (3), Whitevale Corridor (4)
f) minimize stream bank and shoreline disturbance during development; demarcate and protect natural vegetation during and after construction activities	Considered on a case by case basis as part of plan input and review process. Apply vegetative buffer zone guidelines as presented in Appendix 5. Provide copies of the guidelines to all parties involved.
g) review water management schemes impacting fisheries (e.g. hydro power projects, withdrawals for irrigation or industry, groundwater withdrawals)	Consider development of an information package to inform landowners with existing onstream ponds or dams regarding proper water management techniques (e.g. avoid drawdown during fish spawning or egg incubation)
h) require erosion and sediment controls during and after construction, including site rehabilitation as soon after construction as possible, to reduce siltation of receiving waters	Part of plan input and review process; liaise with OMOE, Conservation Authorities, municipalities Encourage use of filter cloth, rapid revegetation techniques (soil bioengineering) Increase compliance monitoring and enforcement

i) discourage dredging and channelization when alternate methods of channel management exist; where channelization is unavoidable, natural channel features are to be incorporated, and passage for fish migration provided where appropriate	Part of plan input and review process; liaise with OMOE, Conservation Authorities, municipalities; increase compliance monitoring and enforcement
j) prohibit direct inflow of untreated stormwater into watercourses	Part of plan input and review process; liaise with OMOE, Conservation Authorities; increase compliance monitoring and enforcement Ensure that stormwater treatment and urban runoff controls reflect current technology, e.g. source control of stormwater, retention/detention facilities, landscape design; require that sediment control ponds be designed to detain at least 125 m^3/ha runoff from the development for at least 12 hours, or be capable of removing particle sizes down to 40 microns (interim guidelines based on a compromise between pond size and cost, and effectiveness of sediment and nutrient removal, Peter White, pers. comm.)
k) work with municipalities to encourage the maintenance and upkeep of stormwater control structures and stream bank stabilization projects	e.g. retention ponds
l) develop education and extension programs to improve public, corporate and governmental understanding of integrated resource management and the ecosystem approach to fisheries protection and rehabilitation; ensure recognition of the biological and socio-economic benefits of healthy fisheries	Resource Education Kit is now available; intended to develop appreciation and understanding of natural resource management at the primary school level Development of a Mitigation Education Program proposed to explain use of landscape ecology and soil bioengineering to mitigate impacts on aquatic ecosystems as a result of development Prepare a guide that illustrates how urban fisheries habitat requirements/fishing access can be incorporated into development proposals Consider organizing an annual Fisheries Science Education Day to update key agencies on new techniques, current projects
m) prohibit the construction of onstream ponds	

STRATEGY II) REHABILITATE DEGRADED FISH HABITAT, WITH AN EMPHASIS ON SENSITIVE COLDWATER SYSTEMS ALONG THE OAK RIDGES MORAINE; REHABILITATE WARMWATER FISHERIES

TACTICS	COMMENTS
a) maintain established cooperative rehabilitation projects, and encourage new projects with CA's, municipalities, local angler clubs, interest groups, scientific associations and universities, individual landowners and other government agencies (e.g. OMAF, OMOE)	Implement joint rehabilitation projects with these agencies; support participation in CFIP, COFAP programs

b) establish a priority system for habitat rehabilitation projects	Starting in 1988, develop a five year plan in conjunction with MTRCA to prioritize rehabilitation projects
c) continue stream rehabilitation programs to improve degraded fish habitat, with emphasis on headwater areas of streams; continue to develop practical expertise in habitat rehabilitation, including that for large rivers	Consider instream boulder placement, bank stabilization, riparian planting, livestock fencing
d) remove undesirable barriers to fish migration while maintaining sea lamprey control; prevent the construction of new dams	If dam removal is not feasible, encourage conversion to bottom-draw discharge to minimize warming of downstream water; consider modification to allow fish passage (i.e. install fishway)

STRATEGY III) PROTECT EXISTING FISH STOCKS DURING VULNERABLE PERIODS SUCH AS MIGRATION, SPAWNING AND NURSERY STAGES

TACTICS	COMMENTS
a) identify migration routes, timing of spawning runs, spawning areas, and nursery habitats	
b) enforce existing fishing regulations; continue to identify and implement new measures required to protect fish populations	Continue monitoring areas sustaining high fishing pressure e.g. lower reaches in the spring
c) direct the timing of development activities in and around water; instream work permitted according to the guidelines presented in Appendix 7 and figure 9 in order to protect migratory corridors for salmonids, production zones (spawning/nursery habitat) for migratory salmonids, production zones for resident salmonids, and migratory corridors and production zones for warmwater species	In conjunction with Conservation Authorities and adjoining districts, amend construction timing guidelines as necessary, when new biological information becomes available; construction proposals in nearshore areas of Lake Ontario will be evaluated on a case-by-case basis; sections from the mouth to approx. the 3rd Concession on the West Duffins and Hwy 2 on the main river have been designated as migratory corridors for salmonids (rainbow trout, Pacific salmon, brown trout); the sections above the migratory corridors to Whitevale Dam on the West Duffins and Newman dam on the main river represent the migratory salmonid production zone (rainbow trout); above these barriers is a production zone for resident salmonids (brook trout)- in addition, tributaries to the main river such as Brougham Ck., Urfe Ck., and Ganatsekiagon Ck. are considered as resident salmonid production zones; Duffins Ck. up to Newman Dam and West Duffins Ck. up to Whitevale Dam are designated as migratory corridors and/or production zones for warmwater species
d) ensure adherence to mitigation techniques during construction	
e) monitor and implement improvements in mitigation techniques on construction sites, i.e. apply best practicable technology	Input at plan review stage; monitor during implementation Use filter cloth, soil bioengineering techniques

STRATEGY IV) PARTITION MIGRATORY FROM RESIDENT POPULATIONS IN SPAWNING AND/OR NURSERY STREAMS, TO PREVENT OR MINIMIZE INTERSPECIFIC COMPETITION AND TO ENHANCE PRODUCTIVITY

TACTICS	COMMENTS
a) use existing dams and obstructions as barriers where required; employ fishways to selectively facilitate or restrict upstream access	Newman's Dam on East Branch and Whitevale Dam on West Branch provide effective barriers that isolate migratory salmonids from resident brook trout

STRATEGY V) MAINTAIN THE GENETIC INTEGRITY OF EXISTING FISH POPULATIONS

TACTICS	COMMENTS
a) prevent the introduction of wild, domesticated and non-native fish stocks which would have a negative impact on native or naturalized fish populations	Enforcement of Ontario Fishing Regulations
b) identify key fish stocks	

STRATEGY VI) CONTROL EXPLOITATION RATES TO PREVENT OVER-HARVESTING OF FISH STOCKS

TACTICS	COMMENTS
a) continue to enforce existing creel limits and fishing seasons; investigate need for more enforcement personnel; prioritize enforcement effort	Resident rainbow, brook and brown trout require protection via closed seasons
b) increase public awareness and appreciation of special fisheries regulations	
c) evaluate the need for proposed and existing regulations based on biological merit and social, economic and ethical concerns; implement these as required	
d) redirect fishing effort to under-utilized waters and species	Prepare brochure to promote fishing for under-utilized species in district

STRATEGY VII) IMPROVE PUBLIC ACCESS TO FISHERIES

TACTICS	COMMENTS
a) develop an extension program involving private landowners, angler organizations and municipalities to improve angler awareness, enhance fishing access, and foster working relations amongst these groups	Prepare a brochure, with map, outlining angling access in Maple District Develop a mailing list of riparian landowners to inform them of fisheries management projects and programs

b) encourage individuals, organized user groups and municipalities to provide fishing access, or develop new public access points and facilities, through financial incentives and cost-sharing programs	Investigate where access is limiting and demand for fishing exists; support land easements and other negotiated agreements; consider parking for anglers near Bayley St., Church St. at Highway 401, and Greenwood Conservation Area
c) encourage land acquisition by other agencies (e.g. MTRCA) when fisheries will be a primary beneficiary	

STRATEGY VIII) SUPPLEMENT SELECTED FISH POPULATIONS WITH PLANTINGS OF HEALTHY FISH ACCORDING TO PROVINCIAL STANDARDS AND PROCEDURES

TACTICS	COMMENTS
a) use adult fish transfers where feasible to augment depleted populations or to facilitate range expansion	
b) investigate the applicability of artificial rearing techniques and mini-hatchery projects initiated under CFIP	
c) continue plantings of hatchery-reared fish; review fish stocking targets regularly	Recognize limits to stocking imposed by availability of forage in Lake Ontario; continue to stock rainbow trout and brown trout yearlings in lower Duffins Creek, and 500 brook trout in the Altona tributary of the West Duffins
d) ensure that hatchery fish of the appropriate size are distributed to good quality stocking sites during time when survival will be maximized	

STRATEGY IX) ENCOURAGE THE HARVEST OF UNDER-UTILIZED SPECIES

TACTICS	COMMENTS
a) increase public awareness of under-utilized fish species such as bullhead, carp, sucker and pumpkinseed through an active education and promotional program, particularly in urban areas	Additional angler opportunities exist for warmwater game and non-game species; prepare brochure to promote fishing for under-utilized species in district

STRATEGY X) IMPROVE FISHERIES IN SUITABLE BUT UNDER-UTILIZED HABITAT

TACTICS	COMMENTS
a) assess the need for stocking	Examine the feasibility of stocking brown trout in the Upper Duffins

STRATEGY XI) PROVIDE FISHING OPPORTUNITIES BY CREATING ARTIFICIAL PUT-AND-TAKE FISHERIES IN SELECTED WATERS TO SATISFY DEMAND OR DIVERT PRESSURE FROM RESIDENT FISH STOCKS

TACTICS	COMMENTS
a) investigate the need for put-and-take urban fisheries	
b) encourage the private sector to provide artificial fisheries on a "user pays" basis on private lakes and ponds	
c) purchase disease-free fish from private hatcheries to plant in public waters	Consider this tactic if harvest becomes excessive

STRATEGY XII) ENCOURAGE PUBLIC PARTICIPATION IN THE MANAGEMENT OF LOCAL FISHERIES

TACTICS	COMMENTS
a) solicit public input and review of major management initiatives	Review of DFMP every 5 years; consultation for major experimental management proposals or special regulations
b) encourage cooperative projects with individual landowners, local angler clubs, interest groups	

STRATEGY XIII) DEVELOP A COMPREHENSIVE FISHERIES ASSESSMENT PROGRAM TO MONITOR FISH POPULATIONS AND HABITAT CONDITIONS

TACTICS	COMMENTS
a) develop an index program to monitor the status of local fish populations	Stream assessment crew to implement; conduct long-term studies on juvenile salmonids; refine potential yield estimates to ensure targets are reasonable
b) initiate aquatic habitat inventory (survey and habitat assessment components) on unsurveyed waters and waters subject to rapid land use changes; resurvey previously inventoried waters as required.	Resurvey in 1990
c) develop and maintain creel survey programs to monitor demand and exploitation rates	In cooperation with LOFU for the mouth of the river
d) support, at the district level, the long-term studies of the Lake Ontario Fisheries Unit (under the direction of the Lake Ontario Management Committee) to ensure that fisheries management needs are met	Applies to angler surveys, lamprey monitoring, stocking assessment (e.g. growth, survival, diet) in the lower reaches of the river and river mouth
e) use results from specific fish community studies to direct fisheries management of similar communities	

STRATEGY XIV) PROTECT AND MAINTAIN EXISTING BAITFISH POPULATIONS

TACTICS	COMMENTS
a) monitor trends in baitfish harvest through annual returns from commercial baitfish fishermen	Compare with current models for potential yield (Table 1) to ensure that local fish populations in heavily fished areas are not over-exploited
b) prevent over-harvest of baitfish populations	Limit entry to the fishery and restrict harvest where necessary, based on the results of monitoring (see Tactic (a) above) i.e. control number of catch licenses allowed in each baitfish management unit; adjust harvest by re-directing effort from over to under-utilized waters
c) continue to enforce existing regulations pertinent to the capture and sale of baitfish species, including those to prevent the introduction of competitive fish species and the spread of disease	Inform baitfish dealers of regulations pertaining to their operations; develop a communication package to educate anglers about regulations pertaining to the harvest of baitfish for personal use
d) prevent any baitfish species from local extinction, by controlling harvest and preventing habitat loss	Exclude baitfish harvest from areas inhabited by rare species, e.g. redside dace; advise baitfish fishermen about the status and distribution of rare, threatened or endangered species
e) develop education and extension programs as part of an integrated resource management approach to baitfish protection and rehabilitation	

STRATEGY XV) INCREASE THE AVAILABILITY OF BAITFISH TO ANGLERS

TACTICS	COMMENTS
a) encourage the private aquaculture industry and baitfish fishermen to rear baitfish species (e.g. common white sucker) to reduce demand on natural populations	Provide technical advice and assistance; refer proponents to MOE for approval to remove and discharge water under the Ontario Water Resources Act
b) consider the introduction of suitable baitfish species to suitable waters	
c) encourage local use of baitfish harvested in Maple District	

STRATEGY XVI) DEVELOP A COMPREHENSIVE BAITFISH ASSESSMENT PROGRAM

TACTICS	COMMENTS
a) develop methodology for acquiring data on fishing effort by fishermen	
b) evaluate the potential for habitat improvement to increase baitfish yield of streams	

c) determine productivity and allowable baitfish yields for local waters	Conduct assessment studies of representative waters once every five years
d) identify critical areas of baitfish habitat, in conjunction with other fish habitat mapping studies	

STRATEGY XVII) DEVELOP A COMPREHENSIVE BAITFISH MANAGEMENT PROGRAM

TACTICS	COMMENTS
a) encourage baitfish dealers to submit accurate, detailed record of harvest and other licenced activities	Consider use of incentives, workshops; streamlined administrative procedures
b) maintain waiting lists for baitfish harvest licenses	Review and update every two years; re-allocate licenses that have been inactive for two years to people on the waiting list
c) encourage the establishment of a Maple District baitfish management council comprised of commercial baitfish fishermen	
d) investigate the implementation of the "exclusive-use block system" as the standard means of sharing baitfish among harvesters	

STRATEGY XVIII) ACTIVELY PROMOTE NON-CONSUMPTIVE USES OF LOCAL AQUATIC RESOURCES

TACTICS	COMMENTS
a) develop extension and education programs	Issue news releases to inform the public of upcoming viewing events; prepare and update pamphlets listing and describing viewing opportunities
b) develop fish viewing events and areas	Promote the establishment and preservation of streambank buffer zones for non-consumptive enjoyment of fisheries; install displays to improve public knowledge of the resource; improve public access to fish viewing areas; encourage incorporation of fish viewing facilities in new projects where feasible

STRATEGY XIX) PREVENT THE EXTINCTION OF RARE, THREATENED AND ENDANGERED SPECIES

TACTICS	COMMENTS
a) establish the distribution and habitat requirements of these species (e.g. redside dace, Lake Simcoe whitefish stock) in Maple District	Through the aquatic habitat inventory program
b) protect areas inhabited by these species from the impacts of development and fishing	Part of plan input and review process and baitfish management program
c) rehabilitate degraded fish habitat	

d) maintain public awareness of rare, threatened and endangered species

Advise baitfish fishermen about the status and distribution of these species

(e) augment declining populations where feasible, by culture

LAKE SIMCOE MANAGEMENT ZONE

Lake Simcoe has a surface area of 725 km² and a drainage area of 2,840 km². It is the largest lake in southern Ontario, exclusive of the Great Lakes. Land use in the basin is 61% agricultural, 37% forested and 2% urban. Major urban centres are Barrie, Orillia and Lagoon City (in Huronia District) and Newmarket, Aurora, Holland Landing, Keswick, Sutton, Beaverton, Uxbridge, Sunderland, Mount Albert and Cannington (in Maple District). Because Lake Simcoe, its watershed and its tributaries are an integrated ecological unit, they have been identified as a single management zone. In order to distinguish between management activities directed towards lake fisheries and river fisheries, two subzones have been identified: Lake Simcoe proper and tributaries to Lake Simcoe. Responsibility for the management of Lake Simcoe is shared by Maple and Huronia Districts.

Detailed strategies and tactics deal with fisheries management issues on Lake Simcoe. Objectives in this subzone are:

- rehabilitate the coldwater fish community
- attain stocking targets for lake trout and lake whitefish
- prohibit introduction of non-native fish species, such as Pacific salmon and brown trout
- continue to control harvest of lake trout and lake whitefish
- encourage harvest of rainbow smelt
- control baitfish harvest
- protect littoral and nearshore habitat, including spawning shoals and nursery areas
- in conjunction with the Lake Simcoe Region Conservation Authority, municipalities, OMAF and OMOE implement a comprehensive, watershed-wide phosphorous control strategy (Lake Simcoe Environmental Management Strategy, LSEMS) to reduce nutrient enrichment and sedimentation of Lake Simcoe

There are five main tributaries to Lake Simcoe in Maple District: the Holland River, Black River, Pefferlaw Brook, Beaverton River and Talbot River. Headwater tributaries are generally in the interlobate moraine. Land use in all of these basins is primarily agricultural.

The Holland River flows into Lake Simcoe at the southern tip of Cook Bay, and drains an area of 572 km². Major tributaries are the Schomberg River (or west branch) and the East Holland River. The Maskinonge (or Jersey) River drains 35 km² on the northeast edge of the Holland basin, and is similar physiographically to the lower Holland River. Urban centers are Aurora, Holland Landing, Newmarket, Bradford and Schomberg. Lower reaches arise on a till/sand plain. The Holland Marsh and associated cultivated lands are in a lowland area that was flooded by Lake Simcoe after the last glacial period.

The Black River flows into Lake Simcoe just west of Sutton, and drains an area of 205 km². Major tributaries are Zephyr Creek, Mt. Albert Creek and

Vivian Creek. Urban centres are Sutton and Mt. Albert. The lower reaches have extensive riverine wetlands.
Pefferlaw Brook flows into Lake Simcoe just east of Duclos Point, and drains an area of 238 km². Major tributaries are Pefferlaw Brook (or west branch) and Uxbridge Brook (or east branch). Urban centres are Pefferlaw, Uxbridge and Udora. The lower reaches have extensive riverine wetlands.

The Beaverton River flows into Lake Simcoe at Beaverton, and drains an area of 174 km². The major tributaries are Vrooman Creek (or west branch) and the Beaverton River (or east branch). Urban centers are Beaverton, Cannington and Sunderland.

The Talbot River flows into Lake Simcoe near Gamebridge, and drains an area of 150 km². The Talbot River is part of the Trent-Severn Waterway that links Lake Ontario with Georgian Bay.

Detailed strategies and tactics deal with fisheries management issues on rivers tributary to Lake Simcoe. **Objectives in this subzone are:**

- protect sensitive portions of streams from the effects of urban development on fish habitat and water quality, particularly cold headwater tributaries supporting resident brook trout populations

- implement and maintain effective habitat rehabilitation works

- protect spawning smallmouth bass using fish sanctuaries

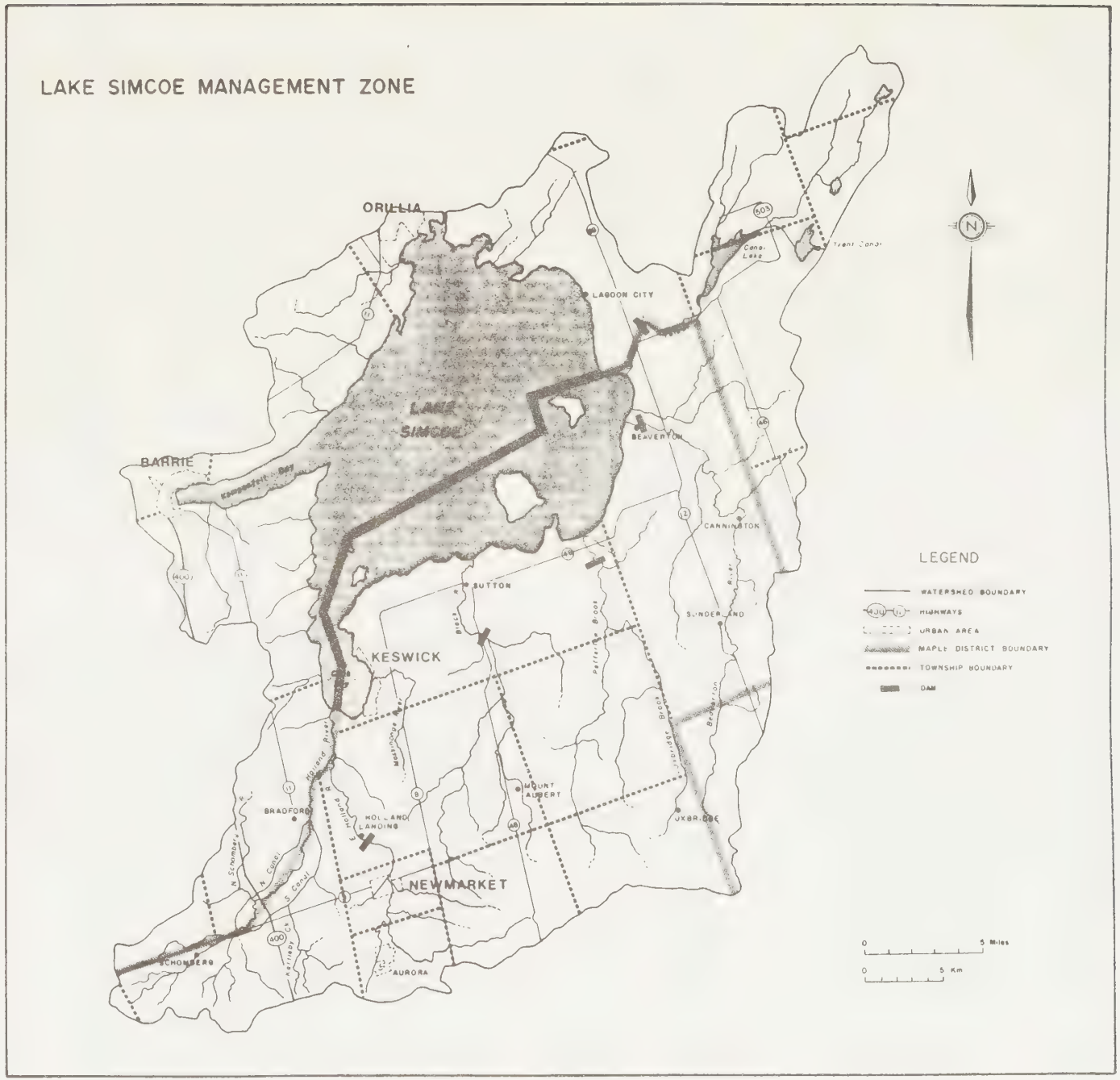
- protect and enhance walleye and muskellunge spawning habitat, including wetlands and access corridors to wetlands

- ensure that water management schemes on the Trent-Severn Waterway address flow requirements for fish

- modify or remove barriers to fish migration where appropriate

- determine effectiveness of fishing seasons and fish sanctuaries

- control baitfish harvest


LAKE SIMCOE MANAGEMENT ZONE
ORILLIA
LAGOON CITY
LAKE SIMCOE
BARRIE
BEAVERTON
CANNINGTON
BUTTON
SUNDERLAND
KESWICK
BRADFORD
HOLLAND LANDING
MOUNT ALBERT
UXBRIDGE
NEWMARKET
SCHOMBERG
AURORA
LEGEND
WATERSHED BOUNDARY
HIGHWAYS
URBAN AREA
MAPLE DISTRICT BOUNDARY
TOWNSHIP BOUNDARY
DAM
0 5 Miles
0 5 Km

6.1 LAKE SIMCOE MANAGEMENT ZONE, SUBZONE 1: LAKE SIMCOE PROPER. IN SUMMER, DEEPWATER AREAS OF LAKE SIMCOE ARE USED FOR COLDWATER FISHERIES (LAKE TROUT, LAKE WHITEFISH AND BURBOT), AND NEARSHORE OR SHOAL AREAS ARE USED FOR WARMWATER FISHERIES (YELLOW PERCH, WALLEYE, SMALLMOUTH BASS, ROCK BASS). IN WINTER THERE IS A LARGE ICE FISHERY FOR LAKE TROUT, LAKE WHITEFISH, YELLOW PERCH AND LAKE HERRING. THERE IS A COMMERCIAL FOOD-FISH FISHERY FOR CARP, AND A SUBSTANTIAL BAITFISH INDUSTRY.

STRATEGY I) PROTECT FISHERIES HABITAT BY MINIMIZING THE EFFECTS OF DEVELOPMENT, WITH EMPHASIS ON HEADWATER AND OTHER BIOLOGICALLY SIGNIFICANT HABITAT

TACTICS	COMMENTS
a) identify sensitive areas, including groundwater sources, spawning and nursery habitats, through inventory and habitat assessment programs	In addition to a field crew for stream assessment, use aerial photography, thermal mapping, video cameras
b) enforce existing legislation pertaining to fish habitat protection	Ensure that both Huronia and Maple Districts are consistent in their approach to fish habitat protection (e.g. for Thorah Is.) during such activities as harbour development, lakeshore filling, beach construction, jetty and groyn construction, dredging
c) prohibit alteration of shorelines and nearshore habitats that would be detrimental to fisheries	Prohibit removal of shoal materials in lake trout and lake whitefish spawning areas
d) implement the federal Department of Fisheries and Oceans policy for the management of fish habitat, including the principle of no net loss of fish habitat (Appendix 6)	New initiative. Strive to balance unavoidable habitat losses with habitat replacement on a project-by-project basis
e) liaise with LSRCA and other municipal, provincial, federal agencies (e.g. DOE, DFO, OMOE, OMAF, Ontario Hydro) to ensure that sensitive habitat is identified and protected; recognize fisheries, where appropriate, as the most sensitive use; continue municipal plan input and review	
f) implement wetland management policy that will protect estuarine wetlands; evaluate the fisheries significance of the wetlands in Maple District; consider valuable wetlands in the plan input and review process; inform private landowners about valuable wetlands on or adjacent to their property, and the importance of those wetlands to fisheries and water management	Encourage mechanical harvesting of aquatic weeds, as an alternative to herbicide treatment Wetlands associated with this zone were classified under the OWES as follows: Morning Glory Swamp (2), Georgina Island (3), Talbot Rivermouth Swamp (3), Thorah Island (3), Riverview Beach Wetland (6)
g) minimize shoreline disturbance during development; demarcate and protect natural vegetation during and after construction activities	Considered on a case by case basis as part of plan input and review process. Apply vegetative buffer zone guidelines as presented in Appendix 5. Provide copies of the guidelines to all parties involved.
h) review water management schemes impacting fisheries (e.g. hydro power projects, withdrawals for irrigation or industry, groundwater withdrawals)	Lake Simcoe Rule Curve (water level control plan) could affect spawning or nursery habitats; identify habitats at risk from water level fluctuations

i) require erosion and sediment controls during and after construction, including site rehabilitation as soon after construction as possible, to reduce siltation of receiving waters	Part of plan input and review process; liaise with OMOE, Conservation Authorities, municipalities Encourage use of filter cloth, rapid revegetation techniques (soil bioengineering) Increase compliance monitoring and enforcement
j) prohibit direct inflow of untreated stormwater into watercourses	Part of plan input and review process; liaise with OMOE, Conservation Authorities; increase compliance monitoring and enforcement Ensure that stormwater treatment and urban runoff controls reflect current technology, e.g. source control of stormwater, retention/detention facilities, landscape design; require that sediment control ponds be designed to detain at least 125 m^3/ha runoff from the development for at least 12 hours, or be capable of removing particle sizes down to 40 microns (interim guidelines based on a compromise between pond size and cost, and effectiveness of sediment and nutrient removal, Peter White, pers. comm.)
k) implement the Lake Simcoe Development Guidelines (OMOE/OMNR, 1985b) in association with OMOE, LSRCA and municipalities, and the Lake Simcoe Environmental Management Strategy (Anon., 1985)	Seek joint funding to implement the recommendations of the Lake Simcoe Environmental Management Strategy (LSEMS) as soon as possible
l) support OMOE water quality monitoring programs	Continue cooperative limnology program
m) work with municipalities to encourage the maintenance and upkeep of stormwater control structures	e.g. retention ponds
n) develop education and extension programs to improve public, corporate and governmental understanding of integrated resource management and the ecosystem approach to fisheries protection and rehabilitation; ensure recognition of the biological and socio-economic benefits of healthy fisheries	Resource Education Kit is now available; intended to develop appreciation and understanding of natural resource management at the primary school level Development of a Mitigation Education Program proposed to explain use of landscape ecology and soil bioengineering to mitigate impacts on aquatic ecosystems as a result of development Prepare a guide that illustrates how urban fisheries habitat requirements/fishing access can be incorporated into development proposals Consider organizing an annual Fisheries Science Education Day to update key agencies on new techniques, current projects
o) prohibit the construction of onstream ponds	

STRATEGY II) REHABILITATE DEGRADED FISH HABITAT

TACTICS	COMMENTS
a) maintain established cooperative rehabilitation projects, and encourage new projects with CA's, municipalities, local angler clubs, interest groups, scientific associations and universities, individual landowners and other government agencies (e.g. OMAF, OMOE)	Implement joint rehabilitation projects with these agencies; support participation in CFIP, COFAP programs
b) establish a priority system for habitat rehabilitation projects	Starting in 1988, develop a five year plan in conjunction with LSRCA to prioritize rehabilitation projects
c) continue lake and stream rehabilitation programs to improve degraded fish habitat	Augment fisheries habitat by incorporating appropriate design criteria into breakwalls and shoreline modification
d) work to achieve additional reductions in phosphorus loadings from septic systems and agriculture	Encourage OMOE and local Health Unit to assess private septic systems in need of upgrading
e) continue to cooperate with DFO in studies of spawning shoals	

STRATEGY III) PROTECT EXISTING FISH STOCKS DURING VULNERABLE PERIODS SUCH AS MIGRATION, SPAWNING AND NURSERY STAGES

TACTICS	COMMENTS
a) identify migration routes, timing of spawning runs, spawning areas, and nursery habitats	
b) enforce existing fishing regulations; continue to identify and implement new measures required to protect fish populations	
c) direct the timing of development activities in and around water; lakeshore work permitted according to the guidelines presented in Appendix 7 and figure 9 for Lake Simcoe, in order to protect coldwater habitat, spawning shoals and warmwater nearshore habitat	In conjunction with Conservation Authorities and adjoining districts, amend construction timing guidelines as necessary, when new biological information becomes available; assess construction timing in detail, on a case-by-case basis
d) ensure adherence to mitigation techniques during construction	
e) monitor and implement improvements in mitigation techniques on construction sites, i.e. apply best practicable technology	Input at plan review stage; monitor during implementation Use filter cloth, soil bioengineering techniques

STRATEGY IV) MAINTAIN THE GENETIC INTEGRITY OF EXISTING FISH POPULATIONS

TACTICS	COMMENTS
a) prevent the introduction of wild, domesticated and non-native fish stocks which would have a negative impact on native or naturalized fish populations	Enforcement of Ontario Fishing Regulations
b) identify key fish stocks by electrophoretic studies and tagging programs	Continue cooperative programs with University Researchers
c) designate refuge lakes to protect wild stocks of Lake Simcoe lake trout and lake whitefish	Monitor lakes to determine survival and reproduction

STRATEGY V) CONTROL EXPLOITATION RATES TO PREVENT OVER-HARVESTING OF FISH STOCKS

TACTICS	COMMENTS
a) continue to enforce existing creel limits and fishing seasons; investigate need for more enforcement personnel; prioritize enforcement effort	Ensure coordination of enforcement effort between Huronia and Maple Districts
b) increase public awareness and appreciation of special fisheries regulations	e.g. catch-and-release of muskellunge
c) evaluate the need for proposed and existing regulations based on biological merit and social, economic and ethical concerns; implement these as required	Continue to evaluate harvest and season controls implemented in 1977 to protect coldwater stocks; encourage harvest of rainbow trout Evaluate the redesignation of lake herring from baitfish to sport fish, and reassign limits
d) redirect fishing effort to under-utilized waters and species	e.g. ling (burbot) smelt, bass, pike, carp, bullhead, rock bass Prepare brochure to promote fishing for under-utilized species in district

STRATEGY VI) ENCOURAGE THE HARVEST OF UNDER-UTILIZED SPECIES

TACTICS	COMMENTS
a) increase public awareness of under-utilized fish species such as bullhead, carp, sucker, bass, smelt, ling (burbot) and pumpkinseed through an active education and promotional program	Additional angler opportunities exist for warmwater game and non-game species; prepare brochure to promote fishing for under-utilized species in district

STRATEGY VII) IMPROVE FISHERIES IN SUITABLE BUT UNDER-UTILIZED HABITAT

TACTICS	COMMENTS
a) assess the need for introducing walleye, largemouth bass and muskellunge into under-producing waters	Determine the factors limiting populations in waters under consideration for these introductions

STRATEGY VIII) IMPROVE PUBLIC ACCESS TO FISHERIES

TACTICS	COMMENTS
a) develop an extension program involving private landowners, angler organizations and municipalities to improve angler awareness, provide funds for fisheries projects, enhance fishing access, and foster working relations amongst these groups	e.g. derby organizations such as Great Lake Simcoe Ice Fishing Derby, Pefferlaw Opening Day Bass Derby, Beaverton Bass Derby, Keswick Perch Derby Prepare a brochure, with map, outlining angling access in Maple District Improve smelt fishing brochure to include trespass concerns and public fishing areas
b) encourage individuals, organized user groups and municipalities to provide fishing access, or develop new public access points and facilities, through financial incentives and cost-sharing programs	Investigate where access is limiting and demand for fishing exists, and begin a systematic development of access project; support land easements and other negotiated agreements
c) encourage land acquisition by other agencies (e.g. LSRCA) when fisheries will be a primary beneficiary	

STRATEGY IX) SUPPLEMENT SELECTED FISH POPULATIONS WITH PLANTINGS OF HEALTHY FISH ACCORDING TO PROVINCIAL STANDARDS AND PROCEDURES

TACTICS	COMMENTS
a) use adult fish transfers where feasible to augment depleted populations or to facilitate range expansion	Presently, walleye from the Talbot River run are transferred to the Pefferlaw River
b) continue plantings of hatchery-reared fish; review fish stocking targets regularly	Maintain annual rehabilitation stocking levels at 100,000 lake trout yearlings and continue working towards a target of 300,0000 for lake whitefish
c) ensure that hatchery fish of the appropriate size are distributed to good quality stocking sites during time when survival will be maximized	

STRATEGY X) ENCOURAGE PUBLIC PARTICIPATION IN THE MANAGEMENT OF LOCAL FISHERIES

TACTICS	COMMENTS
a) solicit public input and review of major management initiatives	Review of DFMP every 5 years; consultation for major experimental management proposals or special regulations

b) encourage cooperative projects with individual landowners, local angler clubs, interest groups	Based on studies of habitat limitations, initiate projects for introduction or rehabilitation of local muskellunge or largemouth bass populations

STRATEGY XI) DEVELOP A COMPREHENSIVE FISHERIES ASSESSMENT PROGRAM TO MONITOR FISH POPULATIONS AND HABITAT CONDITIONS

TACTICS	COMMENTS
a) develop an index program to monitor the status of local fish populations	In cooperation with LSFAU; refine potential yield estimates to ensure targets are reasonable
b) develop and maintain creel survey programs to monitor demand and exploitation rates	In cooperation with the LSFAU; provide funds for systematic, long-term program
c) support, at the district level, the long-term studies of the Lake Simcoe Fisheries Assessment Unit (under the direction of the Lake Simcoe Management Committee) to ensure that fisheries management needs are met	Applies to angler surveys, fish population assessment (e.g. growth, survival, diet), stocking assessment Increase the number of permanent staff to facilitate program implementation
d) evaluate the impact of introduced fish on resident fish populations	e.g. rainbow smelt, carp, rainbow trout, pike
e) monitor and map fish habitat and water quality	
f) evaluate the social, economic and fisheries impacts of fishing derbies and tournaments	
g) use results from specific fish community studies to direct fisheries management of similar communities	

STRATEGY XII) LIMIT THE PRESENT LEVEL OF COMMERCIAL FISHING TO THE EXISTING LICENSES IN MAPLE DISTRICT

TACTICS	COMMENTS
a) monitor harvest on an annual basis	

STRATEGY XIII) MAINTAIN VIABLE COMMERCIAL FISHERIES OPERATIONS THAT DO NOT CONFLICT WITH ESTABLISHED OR POTENTIAL RECREATIONAL FISHERIES

TACTICS	COMMENTS
a) when conflicts occur, consideration will be given to purchasing commercial fisheries, restricting harvest or encouraging use of alternate species or type of gear	When the same species are sought by commercial and recreational fishermen, priority will be given to the recreational fishery
b) support fishing practices and techniques that prevent the harvest of non-target species	e.g. adoption of live capture gear where practical

STRATEGY XIV) ENCOURAGE THE EXSISTING COMMERCIAL FISHING INDUSTRY TO SEEK MARKETS FOR NEW AND UNDER-UTILIZED SPECIES THAT COULD SUPPORT COMMERCIAL HARVEST (e.g. burbot, suckers)

STRATEGY XV) PROTECT AND MAINTAIN EXISTING BAITFISH POPULATIONS

TACTICS	COMMENTS
a) monitor trends in baitfish harvest through annual returns from commercial baitfish fishermen	Compare with current models for potential yield (Table 1) to ensure that local fish populations in heavily fished areas are not over-exploited
b) prevent over-harvest of baitfish populations	Limit entry to the fishery and restrict harvest where necessary, based on the results of monitoring (see Tactic (a) above) i.e. control number of catch licenses allowed in each baitfish management unit (40 licenses in this unit); adjust harvest by re-directing effort from over to under-utilized waters
c) continue to enforce existing regulations pertinent to the capture and sale of baitfish species, including those to prevent the introduction of competitive fish species and the spread of disease	Inform baitfish dealers of regulations pertaining to their operations; develop a communication package to educate anglers about regulations pertaining to the harvest of baitfish for personal use
d) prevent any baitfish species from local extinction, by controlling harvest and preventing habitat loss	Exclude baitfish harvest from areas inhabited by rare species, e.g. redside dace; advise baitfish fishermen about the status and distribution of rare, threatened or endangered species
e) develop education and extension programs as part of an integrated resource management approach to baitfish protection and rehabilitation	

STRATEGY XVI) INCREASE THE AVAILABILITY OF BAITFISH TO ANGLERS

TACTICS	COMMENTS
a) encourage the private aquaculture industry and baitfish fishermen to rear baitfish species (e.g. common white sucker) to reduce demand on natural populations	Provide technical advice and assistance; refer proponents to MOE for approval to remove and discharge water under the Ontario Water Resources Act
b) consider the introduction of suitable baitfish species to suitable waters	
c) encourage local use of baitfish harvested in Maple District	

STRATEGY XVII) DEVELOP A COMPREHENSIVE BAITFISH ASSESSMENT PROGRAM

TACTICS	COMMENTS
a) develop methodology for acquiring data on fishing effort by fishermen	
b) evaluate the potential for habitat improvement to increase baitfish yield of streams	
c) determine productivity and allowable baitfish yields for local waters	Conduct assessment studies of representative waters once every five years
d) identify critical areas of baitfish habitat, in conjunction with other fish habitat mapping studies	

STRATEGY XVIII) DEVELOP A COMPREHENSIVE BAITFISH MANAGEMENT PROGRAM

TACTICS	COMMENTS
a) encourage baitfish dealers to submit accurate, detailed record of harvest and other licenced activities	Consider use of incentives, workshops; streamlined administrative procedures
b) maintain waiting lists for baitfish harvest licenses	Review and update every two years; re-allocate licenses that have been inactive for two years to people on the waiting list
c) re-organize baitfish management areas in Maple District to isolate the Lake Simcoe unit (unit 13)	It currently overlaps with river mouths included in units 10, 11 and 12 (Fig. 8)
d) encourage the establishment of a Maple District baitfish management council comprised of commercial baitfish fishermen	
e) investigate the implementation of the "exclusive-use block system" as the standard means of sharing baitfish among harvesters	

STRATEGY XIX) ACTIVELY PROMOTE NON-CONSUMPTIVE USES OF LOCAL AQUATIC RESOURCES

TACTICS	COMMENTS
a) develop extension and education programs	Issue news releases to inform the public of upcoming viewing events; prepare and update pamphlets listing and describing viewing opportunities
b) develop fish viewing events and areas	Promote the establishment and preservation of streambank buffer zones for non-consumptive enjoyment of fisheries; install displays to improve public knowledge of the resource; improve public access to fish viewing areas; encourage incorporation of fish viewing facilities in new projects where feasible

STRATEGY XX) PREVENT THE EXTINCTION OF RARE, THREATENED AND ENDANGERED SPECIES

TACTICS	COMMENTS
a) establish the distribution and habitat requirements of these species (e.g. redside dace, Lake Simcoe whitefish stock) in Maple District	Through the aquatic habitat inventory program; Lake Simcoe whitefish is designated as threatened; muskellunge populations should be closely monitored
b) protect areas inhabited by these species from the impacts of development and fishing	Part of plan input and review process and baitfish management program
c) rehabilitate degraded fish habitat	
d) maintain public awareness of rare, threatened and endangered species	Advise baitfish fishermen about the status and distribution of these species
(e) augment declining populations where feasible, by culture	e.g. Lake Simcoe whitefish stock

6.2 LAKE SIMCOE MANAGEMENT ZONE, SUBZONE 2: LAKE SIMCOE TRIBUTARIES. THE LOWER REACHES OF RIVERS IN THIS ZONE ARE MARSHY, AND ARE USED PRIMARILY FOR WARMWATER FISHERIES. THE UPPER REACHES ARE COOL OR COLD, AND SUPPORT BROOK TROUT FISHERIES. A SUBSTANTIAL BAITFISH INDUSTRY BASED ON EMERALD SHINERS AND GOLDEN SHINERS EXISTS IN THE LOWER REACHES.

STRATEGY I) PROTECT FISHERIES HABITAT BY MINIMIZING THE EFFECTS OF DEVELOPMENT, WITH EMPHASIS ON HEADWATER AND OTHER BIOLOGICALLY SIGNIFICANT HABITAT

TACTICS	COMMENTS
a) identify sensitive areas, including groundwater sources, spawning and nursery habitats, through inventory and habitat assessment programs	In addition to a field crew for stream assessment, use aerial photography, thermal mapping, video cameras
b) enforce existing legislation pertaining to fish habitat protection	
c) implement the federal Department of Fisheries and Oceans policy for the management of fish habitat, including the principle of **no net loss of fish habitat** (Appendix 6)	New initiative. Strive to balance unavoidable habitat losses with habitat replacement on a project-by-project basis
d) liaise with LSRCA and other municipal, provincial, federal agencies (e.g. DOE, OMOE, OMAF, Ontario Hydro) to ensure that sensitive habitat is identified and protected; recognize fisheries, where appropriate, as the most sensitive use; continue municipal plan input and review	
e) implement wetland management policy that will protect headwater, riverine and estuarine wetlands; evaluate the fisheries significance of the wetlands in Maple District; consider valuable wetlands in the plan input and review process; inform private landowners about valuable wetlands on or adjacent to their property, and the importance of those wetlands to fisheries and water management	Encourage mechanical harvesting of aquatic weeds as an alternative to herbicide treatment e.g. Maskinonge River Wetlands associated with this zone were classified under the OWES as follows: Beaverton River (1), Holland Marsh (1), Lower Uxbridge Brook (1), Mount Albert (1), Pottageville Complex (1), Gibson Hill Swamp (2), Musselman Lake (2), Upper Pefferlaw Complex #1 (2), Manilla Swamp (3), Upper Uxbridge Brook (3), Black River Complex #1 (4), Maskinonge River (4), South Canal (4), St. James (4), Zephr Creek (4), East of Egypt (5), Franklin Pond (5), Lower Pefferlaw Brook Complex (5), Sandford Complex (5), Upper Pefferlaw Brook Complex #2 (5), Black River Headwater Complex (6), Hall Lake (6), Mossington Park (6), South of Uxbridge Swamp (6), Upper Pefferlaw #3 (6), Upper Pefferlaw Complex #4 (6), Vandorf Bog (6), Vroomanton (6), Black River #3 (7), Black River #4 (7), Leaskdale Swamp Complex (7), Upper Pefferlaw Complex #6 (7), Victoria Corners (7)
f) minimize stream bank and shoreline disturbance during development; demarcate and protect natural vegetation during and after construction activities	Considered on a case by case basis as part of plan input and review process. Apply vegetative buffer zone guidelines as presented in Appendix 5. Provide copies of the guidelines to all parties involved.

g) review water management schemes impacting fisheries (e.g. hydro power projects, withdrawals for irrigation or industry, groundwater withdrawals)	Consider development of an information package to inform landowners with existing onstream ponds or dams regarding proper water management techniques (e.g. avoid drawdown during fish spawning or egg incubation) Discontinue fall drawdown of Roger's Reservoir to prevent erosion of accumulated sediments; cooperate with Trent-Severn Canal Authorities to provide minimum flow requirements for walleye and reproduction in the Talbot River
h) require erosion and sediment controls during and after construction, including site rehabilitation as soon after construction as possible, to reduce siltation of receiving waters	Part of plan input and review process; liaise with OMOE, Conservation Authorities, municipalities Encourage use of filter cloth, rapid revegetation techniques (soil bioengineering) Increase compliance monitoring and enforcement
i) discourage dredging and channelization when alternate methods of channel management exist; where channelization is unavoidable, natural channel features are to be incorporated, and passage for fish migration provided where appropriate	Part of plan input and review process; liaise with OMOE, Conservation Authorities, municipalities; increase compliance monitoring and enforcement
j) implement the Lake Simcoe Development Guidelines (OMOE/OMNR, 1985b) in association with OMOE, LSRCA and municipalities, and the Lake Simcoe Environmental Management Strategy (Anon., 1985)	Seek joint funding to implement recommendations of LSEMS as soon as possible
k) prohibit direct inflow of untreated stormwater into watercourses	Part of plan input and review process; liaise with OMOE, Conservation Authorities; increase compliance monitoring and enforcement Ensure that stormwater treatment and urban runoff controls reflect current technology, e.g. source control of stormwater, retention/detention facilities, landscape design; require that sediment control ponds be designed to detain at least 125 m^3/ha runoff from the development for at least 12 hours, or be capable of removing particle sizes down to 40 microns (interim guidelines based on a compromise between pond size and cost, and effectiveness of sediment and nutrient removal)
l) work with municipalities to encourage the maintenance and upkeep of stormwater control structures and stream bank stabilization projects	e.g. retention ponds

m) develop education and extension programs to improve public, corporate and governmental understanding of integrated resource management and the ecosystem approach to fisheries protection and rehabilitation; ensure recognition of the biological and socio-economic benefits of healthy fisheries	Resource Education Kit is now available; intended to develop appreciation and understanding of natural resource management at the primary school level Development of a Mitigation Education Program proposed to explain use of landscape ecology and soil bioengineering to mitigate impacts on aquatic ecosystems as a result of development Prepare a guide that illustrates how urban fisheries habitat requirements/fishing access can be incorporated into development proposals Consider organizing an annual Fisheries Science Education Day to update key agencies on new techniques, current projects
n) prohibit the construction of onstream ponds	

STRATEGY II) REHABILITATE DEGRADED FISH HABITAT, WITH AN EMPHASIS ON SENSITIVE COLDWATER SYSTEMS ALONG THE OAK RIDGES MORAINE; REHABILITATE WARMWATER FISHERIES

TACTICS	COMMENTS
a) maintain established cooperative rehabilitation projects, and encourage new projects with CA's, municipalities, local angler clubs, interest groups, scientific associations and universities, individual landowners and other government agencies (e.g. OMAF, OMOE)	Implement joint rehabilitation projects with these agencies; support participation in CFIP
b) establish a priority system for habitat rehabilitation projects	Starting in 1988, develop a five year plan in conjunction with LSRCA to prioritize rehabilitation projects
c) continue stream rehabilitation programs to improve degraded fish habitat, with emphasis on headwater areas of streams; continue to develop practical expertise in habitat rehabilitation, including that for large rivers	Coordinate activities with Huronia District; consider instream boulder placement, bank stabilization, riparian planting, livestock fencing Improve access to small tributaries for pike and muskellunge spawning by repairing culverts, ditches and channels Improve walleye spawning habitat on the Talbot River
d) remove undesirable barriers to fish migration while maintaining sea lamprey control; prevent the construction of new dams	If dam removal is not feasible, encourage conversion to bottom-draw discharge to minimize warming of downstream water (e.g. Pefferlaw Brook Dam); discourage rebuilding of the Sutton Dam or require modification to allow fish passage (i.e. install fishway)

STRATEGY III) PROTECT EXISTING FISH STOCKS DURING VULNERABLE PERIODS SUCH AS MIGRATION, SPAWNING AND NURSERY STAGES

TACTICS	COMMENTS
a) identify migration routes, timing of spawning runs, spawning areas, and nursery habitats	
b) enforce existing fishing regulations; continue to identify and implement new measures required to protect fish populations	Designate fish sanctuaries if clearly required; continue to evaluate the effectiveness of existing sanctuaries such as those for bass the Black River, Pefferlaw Brook, Beaverton River and Talbot River
c) direct the timing of development activities in and around water; instream work permitted according to the guidelines presented in Appendix 7 and figure 9 in order to protect production zones (spawning/nursery habitat) for resident salmonids, and migratory corridors and production zones for warmwater species (e.g. walleye)	In conjunction with Conservation Authorities and adjoining districts, amend construction timing guidelines as necessary, when new biological information becomes available; review development activities in detail, on a case-by-case basis; warmwater construction guidelines may be applied in cases where construction activities in a coldwater zone may impact a warmwater fishery downstream; headwaters of these streams are designated as production zones for salmonids (brook trout) (see Figure 3, Fisheries Resources Maps)
d) ensure adherence to mitigation techniques during construction	
e) monitor and implement improvements in mitigation techniques on construction sites, i.e. apply best practicable technology	Input at plan review stage; monitor during implementation Use filter cloth, soil bioengineering techniques

STRATEGY IV) PARTITION MIGRATORY FROM RESIDENT POPULATIONS IN SPAWNING AND/OR NURSERY STREAMS, TO PREVENT OR MINIMIZE INTERSPECIFIC COMPETITION AND TO ENHANCE PRODUCTIVITY

TACTICS	COMMENTS
a) use existing dams and obstructions as barriers where required; employ fishways to selectively facilitate or restrict upstream access	

STRATEGY V) MAINTAIN THE GENETIC INTEGRITY OF EXISTING FISH POPULATIONS

TACTICS	COMMENTS
a) prevent the introduction of wild, domesticated and non-native fish stocks which would have a negative impact on native or naturalized fish populations	Enforcement of Ontario Fishing Regulations Brown and rainbow trout will not be stocked in Lake Simcoe tributaries
b) identify key fish stocks by electrophoretic studies and tagging programs	Continue working relationships with university researchers

STRATEGY VI) CONTROL EXPLOITATION RATES TO PREVENT OVER-HARVESTING OF FISH STOCKS

TACTICS	COMMENTS
a) continue to enforce existing creel limits and fishing seasons; investigate need for more enforcement personnel; prioritize enforcement effort	
b) increase public awareness and appreciation of special fisheries regulations	
c) evaluate the need for proposed and existing regulations based on biological merit and social, economic and ethical concerns; implement these as required	e.g. special size limits, catch-and-release, gear and bait restrictions
d) redirect fishing effort to under-utilized waters and species	e.g. bullhead, carp, channel catfish Prepare brochure to promote fishing for under-utilized species in district

STRATEGY VII) IMPROVE PUBLIC ACCESS TO FISHERIES

TACTICS	COMMENTS
a) develop an extension program involving private landowners, angler organizations and municipalities to improve angler awareness, provided funds for fisheries projects, enhance fishing access, and foster working relations amongst these groups	e.g. Pefferlaw Anglers Prepare a brochure, with map, outlining angling access in Maple District Develop a mailing list of riparian landowners to inform them of fisheries management projects and programs
b) encourage individuals, organized user groups and municipalities to provide fishing access, or develop new public access points and facilities, through financial incentives and cost-sharing programs	Investigate where access is limiting and demand for fishing exists; support land easements and other negotiated agreements
c) encourage land acquisition by other agencies (e.g. LSRCA) when fisheries will be a primary beneficiary	

STRATEGY VIII) SUPPLEMENT SELECTED FISH POPULATIONS WITH PLANTINGS OF HEALTHY FISH ACCORDING TO PROVINCIAL STANDARDS AND PROCEDURES

TACTICS	COMMENTS
a) use adult fish transfers where feasible to augment depleted populations or to facilitate range expansion	Review success of transfer of ripe walleye from the Talbot River to Pefferlaw Brook, consider other methods if necessary; investigate feasibility of transferring smallmouth bass to all suitable Lake Simcoe tributaries

b) investigate the applicability of artificial rearing techniques and mini-hatchery projects initiated under CFIP	
c) continue plantings of hatchery-reared fish; review fish stocking targets regularly	Maintain annual stocking levels at 500 brook trout in Bogart Creek on the Holland River
d) ensure that hatchery fish of the appropriate size are distributed to good quality stocking sites during time when survival will be maximized	

STRATEGY IX) ENCOURAGE THE HARVEST OF UNDER-UTILIZED SPECIES

TACTICS	COMMENTS
a) increase public awareness of under-utilized fish species such as bullhead, bass, ling (burbot), carp, sucker and pumpkinseed through an active education and promotional program, particularly in urban areas	Additional angler opportunities exist for warmwater game and non-game species; prepare brochure to promote fishing for under-utilized species in district

STRATEGY X) IMPROVE FISHERIES IN SUITABLE BUT UNDER-UTILIZED HABITAT

TACTICS	COMMENTS
a) assess the need for stocking	e.g. brook trout stocking in Bogart Creek
b) consider the removal of barriers to fish colonization	
c) investigate the introduction of walleye, or smallmouth bass into under-producing waters	

STRATEGY XI) ENCOURAGE PUBLIC PARTICIPATION IN THE MANAGEMENT OF LOCAL FISHERIES

TACTICS	COMMENTS
a) solicit public input and review of major management initiatives	Review of DFMP every 5 years; consultation for major experimental management proposals or special regulations
b) encourage cooperative projects with individual landowners, local angler clubs, interest groups	

STRATEGY XII) DEVELOP A COMPREHENSIVE FISHERIES ASSESSMENT PROGRAM TO MONITOR FISH POPULATIONS AND HABITAT CONDITIONS

TACTICS	COMMENTS
a) develop an index program to monitor the status of local fish populations	Stream assessment crew to implement; refine potential yield estimates to ensure targets are reasonable

b) initiate aquatic habitat inventory (survey and habitat assessment components) on unsurveyed waters and waters subject to rapid land use changes; resurvey previously inventoried waters as required.	
c) develop and maintain creel survey programs to monitor demand and exploitation rates	
d) support, at the district level, the long-term studies of the Lake Simcoe Fisheries Assessment Unit (under the direction of the Lake Simcoe Management Committee) ensure that fisheries management needs are met	Applies to angler surveys, fish population assessment (e.g. growth, survival, diet), stocking assessment Increase the number of permanent staff to facilitate program implementation
e) evaluate the impact of migratory fish on resident fish populations	e.g. effects of walleye on resident smallmouth bass stocks
f) use results from specific fish community studies to direct fisheries management of similar communities	

STRATEGY XIII) PROTECT AND MAINTAIN EXISTING BAITFISH POPULATIONS

TACTICS	COMMENTS
a) monitor trends in baitfish harvest through annual returns from commercial baitfish fishermen	Compare with current models for potential yield (Table 1) to ensure that local fish populations in heavily fished areas are not over-exploited
b) prevent over-harvest of baitfish populations	Limit entry to the fishery and restrict harvest where necessary, based on the results of monitoring (see Tactic (a) above) i.e. control number of catch licenses allowed in each baitfish management unit; adjust harvest by re-directing effort from over to under-utilized waters
c) continue to enforce existing regulations pertinent to the capture and sale of baitfish species, including those to prevent the introduction of competitive fish species and the spread of disease	Inform baitfish dealers of regulations pertaining to their operations; develop a communication package to educate anglers about regulations pertaining to the harvest of baitfish for personal use
d) prevent any baitfish species from local extinction, by controlling harvest and preventing habitat loss	Exclude baitfish harvest from areas inhabited by rare species, e.g. redside dace; advise baitfish fishermen about the status and distribution of rare, threatened or endangered species
e) develop education and extension programs as part of an integrated resource management approach to baitfish protection and rehabilitation	

STRATEGY XIV) INCREASE THE AVAILABILITY OF BAITFISH TO ANGLERS

TACTICS	COMMENTS
a) encourage the private aquaculture industry and baitfish fishermen to rear baitfish species (e.g. common white sucker) to reduce demand on natural populations	Provide technical advice and assistance; refer proponents to MOE for approval to remove and discharge water under the Ontario Water Resources Act
b) consider the introduction of suitable baitfish species to suitable waters	
c) encourage local use of baitfish harvested in Maple District	

STRATEGY XV) DEVELOP A COMPREHENSIVE BAITFISH ASSESSMENT PROGRAM

TACTICS	COMMENTS
a) develop methodology for acquiring data on fishing effort by fishermen	
b) evaluate the potential for habitat improvement to increase baitfish yield of streams	
c) determine productivity and allowable baitfish yields for local waters	Conduct assessment studies of representative waters once every five years
d) identify critical areas of baitfish habitat, in conjunction with other fish habitat mapping studies	

STRATEGY XVI) DEVELOP A COMPREHENSIVE BAITFISH MANAGEMENT PROGRAM

TACTICS	COMMENTS
a) encourage baitfish dealers to submit accurate, detailed record of harvest and other licenced activities	Consider use of incentives, workshops; streamlined administrative procedures
b) maintain waiting lists for baitfish harvest licenses	Review and update every two years; re-allocate licenses that have been inactive for two years to people on the waiting list
c) re-organize baitfish management areas in Maple District to isolate the Lake Simcoe unit (unit 13)	It currently overlaps with river mouths included in units 10, 11 and 12 (Fig. 8)
d) encourage the establishment of a Maple District baitfish management council comprised of commercial baitfish fishermen	
e) investigate the implementation of the "exclusive-use block system" as the standard means of sharing baitfish among harvesters	

STRATEGY XVII) ACTIVELY PROMOTE NON-CONSUMPTIVE USES OF LOCAL AQUATIC RESOURCES

TACTICS	COMMENTS
a) develop extension and education programs	Issue news releases to inform the public of upcoming viewing events; prepare and update pamphlets listing and describing viewing opportunities e.g. Talbot River
b) develop fish viewing events and areas	Promote the establishment and preservation of streambank buffer zones for non-consumptive enjoyment of fisheries; install displays to improve public knowledge of the resource; improve public access to fish viewing areas e.g. Talbot River; encourage incorporation of fish viewing facilities in new projects where feasible

STRATEGY XVIII) PREVENT THE EXTINCTION OF RARE, THREATENED AND ENDANGERED SPECIES

TACTICS	COMMENTS
a) establish the distribution and habitat requirements of these species (e.g. redside dace, Lake Simcoe whitefish stock) in Maple District	Through the aquatic habitat inventory program; redside dace occur in a tributary of the West Holland River near Hwy 9; populations of brook trout in Bogart Ck. should be closely monitored (i.e. a localized decline)
b) protect areas inhabited by these species from the impacts of development and fishing	Part of plan input and review process and baitfish management program
c) rehabilitate degraded fish habitat	
d) maintain public awareness of rare, threatened and endangered species	Advise baitfish fishermen about the status and distribution of these species
(e) augment declining populations where feasible, by culture	

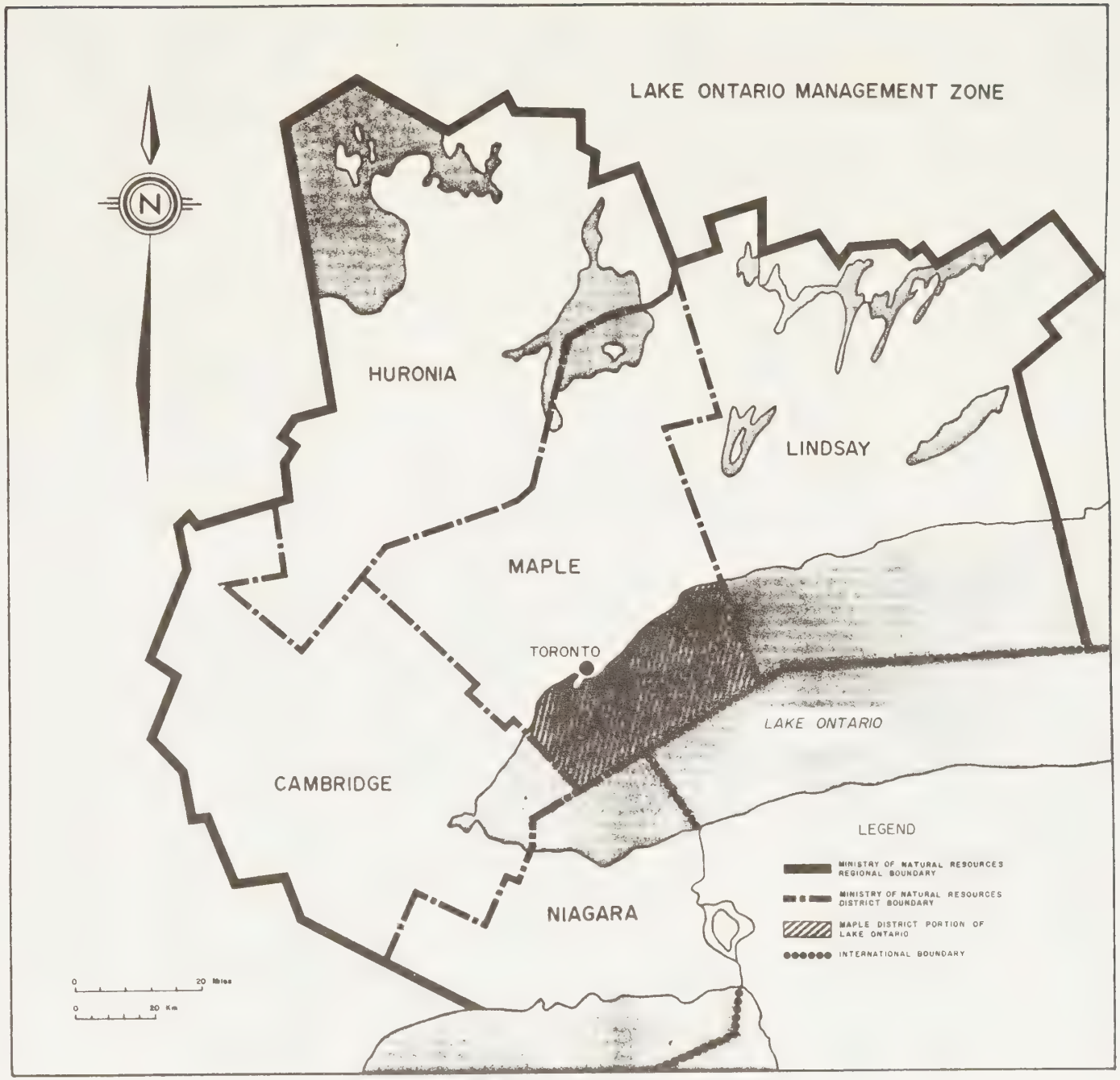
LAKE ONTARIO MANAGEMENT ZONE

All relevant OMNR districts and the Lake Ontario Fisheries Unit have participated in fisheries planning for Lake Ontario and will cooperate in its management. A separate planning document is being prepared for the lake as a whole.

Maple District manages 8.3% (19,500 km^2) of the area of Lake Ontario. Maple District rivers account for only a small portion of the water flowing into Lake Ontario (most of the inflow comes from the Niagara River), but because of high levels of urban and agricultural land use in Maple, these rivers contribute significantly to the poor water quality along the Toronto waterfront.

While the detailed management strategies and tactics presented in the following table focus mainly on fisheries of Lake Ontario proper, management activities on tributary waters are also key to improvements in water, sediment and habitat quality in Lake Ontario. Objectives in this management zone are:

- continue to cooperate with MOE and other agencies to monitor contaminants in water, sediments and fish and develop remedial action plans
- maintain current stocking targets and evaluate species mix for put-and-delayed-take salmonid fishery
- in cooperation with LOFU, assess current use of fishery by boat and shore anglers
- support forage base assessment by LOFU
- improve access to shoreline and launching facilities where need has been demonstrated
- increase the use of Lake Ontario by 16,014 angler-days per year
- support rehabilitation of lake trout populations by LOC
- re-introduce Atlantic salmon; monitor success
- protect tributary waters, and riverine and estuarine wetlands for warmwater species


LAKE ONTARIO MANAGEMENT ZONE
N
HURONIA
LINDSAY
MAPLE
TORONTO
LAKE ONTARIO
CAMBRIDGE
NIAGARA
LEGEND
MINISTRY OF NATURAL RESOURCES REGIONAL BOUNDARY
MINISTRY OF NATURAL RESOURCES DISTRICT BOUNDARY
MAPLE DISTRICT PORTION OF LAKE ONTARIO
INTERNATIONAL BOUNDARY
0 20 Miles
0 20 Km

7. LAKE ONTARIO MANAGEMENT ZONE: LAKE ONTARIO SUPPORTS A SIGNIFICANT COLDWATER FISHERY BASED LARGELY ON STOCKED SALMONIDS, INCLUDING CHINOOK SALMON, COHO SALMON, RAINBOW TROUT, BROWN TROUT AND LAKE TROUT IN OFFSHORE WATERS, NEARSHORE WATERS AND RIVER MOUTHS. THERE IS A SMALL INSHORE FISHERY FOR WARMWATER SPECIES SUCH AS COMMON CARP, WHITE SUCKER AND NORTHERN PIKE.

STRATEGY I) PROTECT FISHERIES HABITAT BY MINIMIZING THE EFFECTS OF DEVELOPMENT, WITH EMPHASIS ON HEADWATER AND OTHER BIOLOGICALLY SIGNIFICANT HABITAT

TACTICS	COMMENTS
a) identify sensitive areas, including groundwater sources, spawning and nursery habitats, through inventory and habitat assessment programs	In addition to a field crew for stream assessment, use aerial photography, thermal mapping, video cameras
b) enforce existing legislation pertaining to fish habitat protection, with special emphasis on shoreline and nearshore habitats	e.g. landfill sites The cumulative impact of the tributaries must also be considered- additional tactics to protect Lake Ontario are designated in the zones that comprise the Lake Ontario watershed
c) implement the federal Department of Fisheries and Oceans policy for the management of fish habitat, including the principle of **no net loss of fish habitat** (Appendix 6)	New initiative. Strive to balance unavoidable habitat losses with habitat replacement on a project-by-project basis
d) liaise with CA's and other municipal, provincial, federal and intenational agencies (e.g. DOE, DFO, IJC, OMOE, OMAF, Ontario Hydro, New York Department of Environmental Conservation (NYDEC), United States Fish and Wildlife Service (USFWS), Great Lakes Fishery Commission (GLFC), LOC) to ensure that sensitive habitat is identified and protected; recognize fisheries, where appropriate, as the most sensitive use; continue municipal plan input and review	e.g. OMOE, IJC, DFO regarding contaminants; CA's regarding landfill and shoreline alterations
e) implement wetland management policy that will protect estuarine wetlands; evaluate the fisheries significance of the wetlands in Maple District; consider valuable wetlands in the plan input and review process; inform private landowners about valuable wetlands on or adjacent to their property, and the importance of those wetlands to fisheries and water management	Protect all wetlands associated with Lake Ontario, with emphasis on those that are provincially significant Wetlands associated with this zone were classified under the OWES as follows: Rouge River Marsh (2), Frenchman's Bay Marshes (2), Carruthers Creek Marsh (3), Rattray Marsh (3), Humber River Marshes (3), Duffins Creek Marsh (3), Highland Creek (6)
f) minimize disturbance during development; demarcate and protect natural vegetation during and after construction activities	Considered on a case by case basis as part of plan input and review process. Apply vegetative buffer zone guidelines as presented in Appendix 5. Provide copies of the guidelines to all parties involved.
g) review water management schemes impacting fisheries (e.g. hydro power projects, withdrawals for irrigation or industry, groundwater withdrawals)	e.g. Ontario Hydro regarding impingement, warm water discharge; Seaway Authority regarding lake water levels

h) require erosion and sediment controls during and after construction, including site rehabilitation as soon after construction as possible, to reduce siltation of receiving waters	Part of plan input and review process; liaise with OMOE, Conservation Authorities, municipalities Monitor dredging, landfilling and channelization activities Increase compliance monitoring and enforcement
i) prohibit direct inflow of untreated stormwater into watercourses	Part of plan input and review process; liaise with OMOE, Conservation Authorities; increase compliance monitoring and enforcement Ensure that stormwater treatment and urban runoff controls reflect current technology, e.g. source control of stormwater, retention/detention facilities, landscape design; require that sediment control ponds be designed to detain at least 125 m^3/ha runoff from the development for at least 12 hours, or be capable of removing particle sizes down to 40 microns (interim guidelines based on a compromise between pond size and cost, and effectiveness of sediment and nutrient removal)
j) work with municipalities to encourage the maintenance and upkeep of stormwater control structures and stream bank stabilization projects	e.g. retention ponds
k) develop education and extension programs to improve public, corporate and governmental understanding of integrated resource management and the ecosystem approach to fisheries protection and rehabilitation; ensure recognition of the biological and socio-economic benefits of healthy fisheries	Resource Education Kit is now available; intended to develop appreciation and understanding of natural resource management at the primary school level Development of a Mitigation Education Program proposed to explain use of landscape ecology and soil bioengineering to mitigate impacts on aquatic ecosystems as a result of development Prepare a guide that illustrates how urban fisheries habitat requirements/fishing access can be incorporated into development proposals Consider organizing an annual Fisheries Science Education Day to update key agencies on new techniques, current projects
l) prohibit the construction of onstream ponds	

STRATEGY II) REHABILITATE DEGRADED FISH HABITAT

TACTICS	COMMENTS
a) maintain established cooperative rehabilitation projects, and encourage new projects with CA's, municipalities, local angler clubs, interest groups, scientific associations and universities, individual landowners and other government agencies (e.g. OMAF, OMOE)	Implement joint rehabilitation projects with these agencies; support participation in CFIP; continue collection of fish for OMOE's contaminant sampling program; cooperate in the writing and implementation of the Remedial Action Plan (RAP) for the Toronto waterfront

b) establish a priority system for habitat rehabilitation projects	For nearshore areas
c) develop practical expertise in creation of artificial shoals in nearshore waters	In cooperation with MTRCA and CVCA, study fish habitat creation and enhancement around lakefill parks e.g. Tommy Thompson Park, Humber Bay, Marie Curtis Park, Bluffer's Park and Ontario Place; an offshore artificial reef being considered for Humber Bay

STRATEGY III) PROTECT EXISTING FISH STOCKS DURING VULNERABLE PERIODS SUCH AS MIGRATION, SPAWNING AND NURSERY STAGES

TACTICS	COMMENTS
a) identify migration routes, timing of spawning runs, spawning areas, and nursery habitats	
b) enforce existing fishing regulations; continue to identify and implement new measures required to protect fish populations	
c) direct the timing of development activities in and around water	Refer to guidelines specified in each management zone for Lake Ontario tributaries; construction proposals in nearshore areas of Lake Ontario will be evaluated on a case-by-case basis (Appendix 7); In conjunction with Conservation Authorities and adjoining districts, amend construction timing guidelines as necessary, when new biological information becomes available
d) ensure adherence to mitigation techniques during construction	
e) monitor and implement improvements in mitigation techniques on construction sites, i.e. apply best practicable technology	Input at plan review stage; monitor during implementation Use filter cloth, soil bioengineering techniques

STRATEGY IV) PARTITION MIGRATORY FROM RESIDENT POPULATIONS IN SPAWNING AND/OR NURSERY STREAMS, TO PREVENT OR MINIMIZE INTERSPECIFIC COMPETITION AND TO ENHANCE PRODUCTIVITY

TACTICS	COMMENTS
a) use existing dams and obstructions as barriers where required; employ fishways to selectively facilitate or restrict upstream access	e.g. for management of migratory salmonids, sea lamprey control
b) construct new weirs or barriers as necessary to selectively restrict or facilitate fish migrations	

STRATEGY V) MAINTAIN THE GENETIC INTEGRITY OF EXISTING FISH POPULATIONS

TACTICS	COMMENTS
a) prevent the introduction of wild, domesticated and non-native fish stocks which would have a negative impact on native or naturalized fish populations	Enforcement of Ontario Fishing Regulations
b) identify key fish stocks by electrophoretic studies and tagging programs	
c) identify measures to protect key fish stocks e.g. refuge lakes	

STRATEGY VI) CONTROL EXPLOITATION RATES TO PREVENT OVER-HARVESTING OF FISH STOCKS

TACTICS	COMMENTS
a) continue to enforce existing creel limits and fishing seasons; investigate need for more enforcement personnel; prioritize enforcement effort	Deployment will be addressed in District Enforcement Plan
b) increase public awareness and appreciation of special fisheries regulations	
c) evaluate the need for proposed and existing regulations based on biological merit and social, economic and ethical concerns; implement these as required	e.g. consider catch-and-release angling for Atlantic salmon, lake trout
d) redirect fishing effort to under-utilized waters and species	Prepare brochure to promote fishing for under-utilized species in district; promote angling opportunities for salmonids (e.g. brown trout) and warmwater species in the nearshore areas

STRATEGY VII) IMPROVE PUBLIC ACCESS TO FISHERIES

TACTICS	COMMENTS
a) develop an extension program involving private landowners, angler organizations and municipalities to improve angler awareness, enhance fishing access, and foster working relations amongst these groups	Prepare a brochure, with map, outlining angling access in Maple District Develop a mailing list of riparian landowners to inform them of fisheries management projects and programs
b) encourage individuals, organized user groups and municipalities to provide fishing access, or develop new public access points and facilities, through financial incentives and cost-sharing programs	Investigate where access is limiting and demand for fishing exists; support land easements and other negotiated agreements; support municipal plans e.g. Mississauga Harbour Development Plan
c) encourage land acquisition by other agencies (e.g. CA's) when fisheries will be a primary beneficiary	

d) promote awareness of urban fishing opportunities	Through the Urban Fishing Program (e.g. events such as Metro Fishing Week); distribution of publications e.g. Toronto Angler's Guide

STRATEGY VIII) SUPPLEMENT SELECTED FISH POPULATIONS WITH PLANTINGS OF HEALTHY FISH ACCORDING TO PROVINCIAL STANDARDS AND PROCEDURES

TACTICS	COMMENTS
a) continue plantings of hatchery-reared fish; review fish stocking targets regularly	Recognize limits to stocking imposed by availability of forage in Lake Ontario Attain current annual stocking targets for Maple District: **Chinook**- 200,000 fingerlings (Credit River) **Coho**- 100,000 yearlings; 50,000 fingerlings (Credit River) **Rainbow trout**- 100,000 (Credit R., Rouge R., Duffins Ck.) **Brown trout**- 135,000 (Humber R., Tommy Thompson Pk., Rouge R., Bluffer's Pk., Duffins Ck., Ashbridge's Bay) **Atlantic salmon**- 40,000 (Credit River) Follow recommendations of the International Predator-Biomass Working Group
b) ensure that hatchery fish of the appropriate size are distributed to good quality stocking sites during time when survival will be maximized	

STRATEGY IX) CONSIDER THE INTRODUCTION OF ADDITIONAL OR ALTERNATIVE FISH SPECIES WHERE SUCH AN INTRODUCTION WOULD NOT HAVE A SERIOUS IMPACT ON THE EXISTING DESIRABLE FISH POPULATION

TACTICS	COMMENTS
a) continue to investigate the success of Atlantic salmon reintroduction	Atlantic salmon stocked near Inglewood on the Credit River in 1988 as part of an experimental plan aimed at establishing a naturally reproducing population

STRATEGY X) ENCOURAGE THE HARVEST OF UNDER-UTILIZED SPECIES

TACTICS	COMMENTS
a) increase public awareness of under-utilized fish species such as bullhead, bass, carp, sucker and pumpkinseed through an active education and promotional program, particularly in urban areas	Additional angler opportunities exist for warmwater game and non-game species; prepare brochure to promote fishing for under-utilized species in district; promote shore and nearshore angling opportunities for such species as brown trout in the spring and fall

STRATEGY XI) ENCOURAGE PUBLIC PARTICIPATION IN THE MANAGEMENT OF LOCAL FISHERIES

TACTICS	COMMENTS
a) solicit public input and review of major management initiatives	Review of DFMP every 5 years; consultation for major experimental management proposals or special regulations
b) encourage cooperative projects with individual landowners, local angler clubs, interest groups	e.g. Charter Boat Operators

STRATEGY XII) DEVELOP A COMPREHENSIVE FISHERIES ASSESSMENT PROGRAM TO MONITOR FISH POPULATIONS AND HABITAT CONDITIONS

TACTICS	COMMENTS
a) develop an index program to monitor the status of local fish populations	In cooperation with LOFU; conduct long-term studies on juvenile salmonids (natural and stocked); refine potential yield estimates to ensure targets are reasonable
b) support, at the district level, the long-term studies of the Lake Ontario Fisheries Unit (under the direction of the Lake Ontario Management Committee) to ensure that fisheries management needs are met	Applies to angler surveys, lamprey monitoring, stocking and forage base assessment (e.g. growth, survival, diet) in the lake and lower reaches of the river
c) develop and maintain creel survey programs to monitor demand and exploitation rates	In cooperation with LOFU (consider shore and boat anglers, Charter Industry)
d) evaluate the impact of migratory fish on resident fish populations	
e) evaluate the social, economic and fisheries impact of fishing derbies and tournaments	
f) use results from specific fish community studies to direct fisheries management of similar communities	

STRATEGY XIII) LIMIT THE PRESENT LEVEL OF COMMERCIAL FISHING TO THE EXISTING LICENSES IN MAPLE DISTRICT

TACTICS	COMMENTS
a) monitor harvest on an annual basis	

STRATEGY XIV) MAINTAIN VIABLE COMMERCIAL FISHERIES OPERATIONS THAT DO NOT CONFLICT WITH ESTABLISHED OR POTENTIAL RECREATIONAL FISHERIES

TACTICS	COMMENTS
a) when conflicts occur, consideration will be given to purchasing commercial fisheries, restricting harvest or encouraging use of alternate species or type of gear	When the same species are sought by commercial and recreational fishermen, priority will be given to the recreational fishery

b) support fishing practices and techniques that prevent the harvest of non-target species	e.g. adoption of live capture gear where practical

STRATEGY XV) ENCOURAGE THE COMMERCIAL FISHING INDUSTRY TO SEEK MARKETS FOR NEW AND UNDER-UTILIZED SPECIES THAT COULD SUPPORT COMMERCIAL HARVEST (e.g. burbot, suckers)

STRATEGY XVI) SUPPORT THE INFORMATION NEEDS AND ENFORCEMENT REQUIREMENTS OF COMMERCIAL FISH MARKETS IN THE TORONTO AREA, AS PART OF ONTARIO'S MODERNIZATION PROGRAM FOR COMMERCIAL FISHERIES

TACTICS	COMMENTS
a) continue to devote a full time Conservation Officer to provincial commercial fisheries enforcement in Maple District	Hire additional staff as necessary

STRATEGY XVII) PROTECT AND MAINTAIN EXISTING BAITFISH POPULATIONS

TACTICS	COMMENTS
a) monitor trends in baitfish harvest through annual returns from commercial baitfish fishermen	Compare with current models for potential yield (Table 1) to ensure that local fish populations in heavily fished areas are not over-exploited
b) prevent over-harvest of baitfish populations	Limit entry to the fishery and restrict harvest where necessary, based on the results of monitoring (see Tactic (a) above) i.e. control number of catch licenses allowed in each baitfish management unit; adjust harvest by re-directing effort from over to under-utilized waters
c) continue to enforce existing regulations pertinent to the capture and sale of baitfish species, including those to prevent the introduction of competitive fish species and the spread of disease	Inform baitfish dealers of regulations pertaining to their operations; develop a communication package to educate anglers about regulations pertaining to the harvest of baitfish for personal use
d) prevent any baitfish species from local extinction, by controlling harvest and preventing habitat loss	Exclude baitfish harvest from areas inhabited by rare species, e.g. redside dace; advise baitfish fishermen about the status and distribution of rare, threatened or endangered species
e) develop education and extension programs as part of an integrated resource management approach to baitfish protection and rehabilitation	

STRATEGY XIX) INCREASE THE AVAILABILITY OF BAITFISH TO ANGLERS

TACTICS	COMMENTS
a) encourage the private aquaculture industry and baitfish fishermen to rear baitfish species (e.g. common white sucker) to reduce demand on natural populations	Provide technical advice and assistance; refer proponents to MOE for approval to remove and discharge water under the Ontario Water Resources Act
b) consider the introduction of suitable baitfish species to suitable waters	
c) encourage local use of baitfish harvested in Maple District	

STRATEGY XX) DEVELOP A COMPREHENSIVE BAITFISH ASSESSMENT PROGRAM

TACTICS	COMMENTS
a) develop methodology for acquiring data on fishing effort by fishermen	
b) evaluate the potential for habitat improvement to increase baitfish yield of streams	
c) determine productivity and allowable baitfish yields for local waters	Conduct assessment studies of representative waters once every five years
d) identify critical areas of baitfish habitat, in conjunction with other fish habitat mapping studies	

STRATEGY XXI) DEVELOP A COMPREHENSIVE BAITFISH MANAGEMENT PROGRAM

TACTICS	COMMENTS
a) encourage baitfish dealers to submit accurate, detailed record of harvest and other licenced activities	Consider use of incentives, workshops; streamlined administrative procedures
b) maintain waiting lists for baitfish harvest licenses	Review and update every two years; re-allocate licenses that have been inactive for two years to people on the waiting list
d) encourage the establishment of a Maple District baitfish management council comprised of commercial baitfish fishermen	
e) investigate the implementation of the "exclusive-use block system" as the standard means of sharing baitfish among harvesters	

STRATEGY XXII) ACTIVELY PROMOTE NON-CONSUMPTIVE USES OF LOCAL AQUATIC RESOURCES

TACTICS	COMMENTS
a) develop extension and education programs	Issue news releases to inform the public of upcoming viewing events; prepare and update pamphlets listing and describing viewing opportunities particularly in urban areas
b) develop fish viewing events and areas	Promote the establishment and preservation of streambank buffer zones for non-consumptive enjoyment of fisheries; install displays to improve public knowledge of the resource particularly in urban areas; improve public access to fish viewing areas; encourage incorporation of fish viewing facilities in new projects where feasible

STRATEGY XXIII) PREVENT THE EXTINCTION OF RARE, THREATENED AND ENDANGERED SPECIES

TACTICS	COMMENTS
a) establish the distribution and habitat requirements of these species in Maple District	Through the aquatic habitat inventory program
b) protect areas inhabited by these species from the impacts of development and fishing	Part of plan input and review process and baitfish management program
c) rehabilitate degraded fish habitat	
d) maintain public awareness of rare, threatened and endangered species	Advise baitfish fishermen about the status and distribution of these species
(e) augment declining populations where feasible, by culture	

INLAND LAKES AND PONDS MANAGEMENT ZONE

This zone includes natural and artificial lakes and ponds with public access in Maple District. Included are cold kettle lakes on the Oak Ridges Moraine, reservoirs such as the Clairville and G. Ross Lord Reservoirs, and urban ponds such as Grenadier Pond and Eglinton Flats Pond. Fisheries in these waters are often supported by stocking, but reproduction of warmwater species may occur.

Detailed strategies and tactics deal with fisheries management issues on inland lakes and ponds. Objectives in this subzone are:

- improve angler access
- increase public awareness and education regarding fishing opportunities in this zone
- minimize the effects of urbanization and development on fish habitat and water quality
- enhance fish habitat where feasible
- consider stocking and/or fish transfers to create or supplement fisheries

8. INLAND LAKES AND PONDS MANAGEMENT ZONE: INCLUDES LAKES AND PONDS OTHER THAN LAKE SIMCOE AND LAKE ONTARIO. KETTLE LAKES ON THE OAK RIDGES MORAINE SUPPORT RAINBOW AND BROOK TROUT FISHERIES. RESERVOIRS AND NATURAL AND ARTIFICIAL PONDS ELSEWHERE IN THE DISTRICT SUPPORT WARMWATER FISHERIES.

STRATEGY I) PROTECT FISHERIES HABITAT BY MINIMIZING THE EFFECTS OF DEVELOPMENT, WITH EMPHASIS ON HEADWATER AND OTHER BIOLOGICALLY SIGNIFICANT HABITAT

TACTICS	COMMENTS
a) identify sensitive areas, including groundwater sources, spawning and nursery habitats, through inventory and habitat assessment programs	In addition to a field crew for stream assessment, use aerial photography, thermal mapping, video cameras
b) enforce existing legislation pertaining to fish habitat protection	
c) implement the federal Department of Fisheries and Oceans policy for the management of fish habitat, including the principle of **no net loss of fish habitat** (Appendix 6)	New initiative. Strive to balance unavoidable habitat losses with habitat replacement on a project-by-project basis
d) liaise with CA's and other municipal, provincial agencies (e.g. OMOE, OMAF) to ensure that sensitive habitat is identified and protected; recognize fisheries, where appropriate, as the most sensitive use; continue municipal plan input and review	
e) implement wetland management policy that will protect estuarine wetlands; evaluate the fisheries significance of the wetlands in Maple District; consider valuable wetlands in the plan input and review process; inform private landowners about valuable wetlands on or adjacent to their property, and the importance of those wetlands to fisheries and water management	Encourage mechanical harvesting of aquatic weeds, as an alternative to herbicide treatment Wetlands associated with this zone were classified under the OWES as follows: Goodwood/Glasgow Complex (2), Heart Lake (2), Preston Lake (6)
f) minimize shoreline disturbance during development; demarcate and protect natural vegetation during and after construction activities	Considered on a case by case basis as part of plan input and review process. Apply vegetative buffer zone guidelines as presented in Appendix 5. Provide copies of the guidelines to all parties involved.
g) review water management schemes impacting fisheries (e.g. hydro power projects, withdrawals for irrigation or industry, groundwater withdrawals)	Consider development of an information package to inform landowners with existing onstream ponds or dams regarding proper water management techniques (e.g. avoid drawdown during fish spawning or egg incubation) Where appropriate, negotiate suitable draw and fill schedules in reservoirs to protect spawning and migrating fish e.g. Milne Reservoir, Stouffville Reservoir, G. Ross Lord Reservoir Continue water level controls during pike spawning and fry emergence in Lake Wilcox over the artificial shoal

h) require erosion and sediment controls during and after construction, including site rehabilitation as soon after construction as possible, to reduce siltation of receiving waters	Part of plan input and review process; liaise with OMOE, Conservation Authorities, municipalities Encourage use of filter cloth, rapid revegetation techniques (soil bioengineering) Increase compliance monitoring and enforcement
i) prohibit direct inflow of untreated stormwater into watercourses	Part of plan input and review process; liaise with OMOE, Conservation Authorities; increase compliance monitoring and enforcement Ensure that stormwater treatment and urban runoff controls reflect current technology, e.g. source control of stormwater, retention/detention facilities, landscape design; require that sediment control ponds be designed to detain at least 125 m^3/ha runoff from the development for at least 12 hours, or be capable of removing particle sizes down to 40 microns (interim guidelines based on a compromise between pond size and cost, and effectiveness of sediment and nutrient removal)
j) work with municipalities to encourage the maintenance and upkeep of stormwater control structures	e.g. retention ponds
k) develop education and extension programs to improve public, corporate and governmental understanding of integrated resource management and the ecosystem approach to fisheries protection and rehabilitation; ensure recognition of the biological and socio-economic benefits of healthy fisheries	Resource Education Kit is now available; intended to develop appreciation and understanding of natural resource management at the primary school level Development of a Mitigation Education Program proposed to explain use of landscape ecology and soil bioengineering to mitigate impacts on aquatic ecosystems as a result of development Prepare a guide that illustrates how urban fisheries habitat requirements/fishing access can be incorporated into development proposals Consider organizing an annual Fisheries Science Education Day to update key agencies on new techniques, current projects

STRATEGY II) REHABILITATE DEGRADED FISH HABITAT

TACTICS	COMMENTS
a) maintain established cooperative rehabilitation projects, and encourage new projects with CA's, municipalities, local angler clubs, interest groups, scientific associations and universities, individual landowners and other government agencies (e.g. OMAF, OMOE)	Implement joint rehabilitation projects with these agencies; support participation in CFIP
b) establish a priority system for habitat rehabilitation projects	

c) remove undesirable barriers to fish migration while maintaining sea lamprey control; prevent the construction of new dams	If dam removal is not feasible, encourage conversion to bottom-draw discharge to minimize warming of downstream water with priority given to ponds occurring in the headwater of coldwater streams; consider modification to allow fish passage (i.e. install fishway) e.g. Milne Dam on Rouge River

STRATEGY III) PROTECT EXISTING FISH STOCKS DURING VULNERABLE PERIODS SUCH AS MIGRATION, SPAWNING AND NURSERY STAGES

TACTICS	COMMENTS
a) identify migration routes, timing of spawning runs, spawning areas, and nursery habitats	
b) enforce existing fishing regulations; continue to identify and implement new measures required to protect fish populations	
c) direct the timing of development activities in and around water; work permitted according to the guidelines presented in Appendix 7 and figure 9 in order to protect production zones (spawning/nursery habitat) for resident salmonids and production zones for warmwater species	In conjunction with Conservation Authorities and adjoining districts, amend construction timing guidelines as necessary, when new biological information becomes available; refer to lake and pond surveys, filed at the district office, for fisheries information on individual sites
d) ensure adherence to mitigation techniques during construction	
e) monitor and implement improvements in mitigation techniques on construction sites, i.e. apply best practicable technology	Input at plan review stage; monitor during implementation Use filter cloth, soil bioengineering techniques

STRATEGY IV) CONTROL EXPLOITATION RATES TO PREVENT OVER-HARVESTING OF FISH STOCKS

TACTICS	COMMENTS
a) continue to enforce existing creel limits and fishing seasons; investigate need for more enforcement personnel; prioritize enforcement effort	Increase enforcement presence at urban ponds e.g. Grenadier Pond, Eglinton Flats
b) increase public awareness and appreciation of special fisheries regulations	Via display units at popular fishing spots
c) evaluate the need for proposed and existing regulations based on biological merit and social, economic and ethical concerns; implement these as required	
d) redirect fishing effort to under-utilized waters and species	Prepare brochure to promote fishing for under-utilized species in district

STRATEGY V) IMPROVE PUBLIC ACCESS TO FISHERIES

TACTICS	COMMENTS
a) develop an extension program involving private landowners, angler organizations and municipalities to improve angler awareness, enhance fishing access, and foster working relations amongst these groups	Prepare a brochure, with map, outlining angling access in Maple District
b) encourage individuals, organized user groups and municipalities to provide fishing access, or develop new public access points and facilities, through financial incentives and cost-sharing programs	Investigate where access is limiting and demand for fishing exists; support land easements and other negotiated agreements Construct facilities such as fishing decks and piers to provide opportunities for shore fishing; should be accessible to those with physical limitations
c) encourage land acquisition by other agencies (e.g. CA's) when fisheries will be a primary beneficiary	
d) promote awareness of urban fishing opportunities	Through the Urban Fishing Program (e.g. events such as Metro Fishing Week); distribution of publications e.g. Toronto Angler's Guide Construct display units at popular fishing areas such as the one in place at the Rouge Marsh

STRATEGY VI) SUPPLEMENT SELECTED FISH POPULATIONS WITH PLANTINGS OF HEALTHY FISH ACCORDING TO PROVINCIAL STANDARDS AND PROCEDURES

TACTICS	COMMENTS
a) use adult fish transfers where feasible to augment depleted populations or to facilitate range expansion b) ensure that hatchery fish of the appropriate size are distributed to good quality stocking sites during times when survival will be maximized	

STRATEGY VII) CONSIDER THE INTRODUCTION OF ADDITIONAL OR ALTERNATIVE FISH SPECIES WHERE SUCH AN INTRODUCTION WOULD NOT HAVE A SERIOUS IMPACT ON THE EXISTING DESIRABLE FISH POPULATION

TACTICS	COMMENTS
a) continue to investigate introductions of fish for urban fisheries	e.g. bullhead, northern pike, bass, rock bass, crappie, pumpkinseed, perch

STRATEGY VIII) ENCOURAGE THE HARVEST OF UNDER-UTILIZED SPECIES

TACTICS	COMMENTS
a) increase public awareness of under-utilized fish species such as bullhead, bass, rock bass, carp, goldfish and pumpkinseed through an active education and promotional program, particularly in urban areas	Additional angler opportunities exist for warmwater game and non-game species; prepare brochure to promote fishing for under-utilized species in district

STRATEGY IX) IMPROVE FISHERIES IN SUITABLE BUT UNDER-UTILIZED HABITAT

TACTICS	COMMENTS
a) assess the need for stocking	
b) consider the removal of barriers to fish colonization	
c) investigate the introduction of smallmouth or largemouth bass, northern pike into under-producing waters not presently supporting a top predator species	

STRATEGY X) PROVIDE FISHING OPPORTUNITIES BY CREATING ARTIFICIAL PUT-AND-TAKE FISHERIES IN SELECTED WATERS TO SATISFY DEMAND OR DIVERT PRESSURE FROM RESIDENT FISH STOCKS

TACTICS	COMMENTS
a) encourage the private sector to provide artificial fisheries on a "user pays" basis, on private lakes and ponds	
b) investigate the need for put-and-take urban fisheries	If appropriate, purchase disease-free fish from private hatcheries to plant in urban ponds

STRATEGY XI) ENCOURAGE PUBLIC PARTICIPATION IN THE MANAGEMENT OF LOCAL FISHERIES

TACTICS	COMMENTS
a) solicit public input and review of major management initiatives	Review of DFMP every 5 years; consultation for major experimental management proposals or special regulations
b) encourage cooperative projects with individual landowners, local angler clubs, interest groups	

STRATEGY XII) DEVELOP A COMPREHENSIVE FISHERIES ASSESSMENT PROGRAM TO MONITOR FISH POPULATIONS AND HABITAT CONDITIONS

TACTICS	COMMENTS
a) develop an index program to monitor the status of local fish populations	Stream assessment crew to implement; refine potential yield estimates to ensure targets are reasonable

b) initiate lake inventory on unsurveyed waters and waters subject to rapid land use changes; resurvey waters with data inventories greater than 5 years old	Encourage university involvement
c) develop and maintain creel survey programs to monitor demand and exploitation rates	
d) use results from specific fish community studies to direct fisheries management of similar communities	Establish type lakes or ponds in order to monitor the status of inland fisheries

STRATEGY XIII) PROTECT AND MAINTAIN EXISTING BAITFISH POPULATIONS

TACTICS	COMMENTS
a) monitor trends in baitfish harvest through annual returns from commercial baitfish fishermen	Compare with current models for potential yield (Table 1) to ensure that local fish populations in heavily fished areas are not over-exploited
b) prevent over-harvest of baitfish populations	Limit entry to the fishery and restrict harvest where necessary, based on the results of monitoring (see Tactic (a) above) i.e. control number of catch licenses allowed in each baitfish management unit; adjust harvest by re-directing effort from over to under-utilized waters
c) continue to enforce existing regulations pertinent to the capture and sale of baitfish species, including those to prevent the introduction of competitive fish species and the spread of disease	Inform baitfish dealers of regulations pertaining to their operations; develop a communication package to educate anglers about regulations pertaining to the harvest of baitfish for personal use
d) prevent any baitfish species from local extinction, by controlling harvest and preventing habitat loss	Exclude baitfish harvest from areas inhabited by rare species, e.g. redside dace; advise baitfish fishermen about the status and distribution of rare, threatened or endangered species
e) develop education and extension programs as part of an integrated resource management approach to baitfish protection and rehabilitation	

STRATEGY XIV) INCREASE THE AVAILABILITY OF BAITFISH TO ANGLERS

TACTICS	COMMENTS
a) encourage the private aquaculture industry and baitfish fishermen to rear baitfish species (e.g. common white sucker) to reduce demand on natural populations	Provide technical advice and assistance; refer proponents to MOE for approval to remove and discharge water under the Ontario Water Resources Act
b) consider the introduction of suitable baitfish species to suitable waters	
c) encourage local use of baitfish harvested in Maple District	

STRATEGY XV) DEVELOP A COMPREHENSIVE BAITFISH ASSESSMENT PROGRAM

TACTICS	COMMENTS
a) develop methodology for acquiring data on fishing effort by fishermen	
b) evaluate the potential for habitat improvement to increase baitfish yield of streams	
c) determine productivity and allowable baitfish yields for local waters	Conduct assessment studies of representative waters once every five years
d) identify critical areas of baitfish habitat, in conjunction with other fish habitat mapping studies	

STRATEGY XVI) DEVELOP A COMPREHENSIVE BAITFISH MANAGEMENT PROGRAM

TACTICS	
a) encourage baitfish dealers to submit accurate, detailed record of harvest and other licenced activities	Consider use of incentives, workshops; streamlined administrative procedures
b) maintain waiting lists for baitfish harvest licenses	Review and update every two years; re-allocate licenses that have been inactive for two years to people on the waiting list
c) encourage the establishment of a Maple District baitfish management council comprised of commercial baitfish fishermen	
d) investigate the implementation of the "exclusive-use block system" as the standard means of sharing baitfish among harvesters	

STRATEGY XVII) ACTIVELY PROMOTE NON-CONSUMPTIVE USES OF LOCAL AQUATIC RESOURCES

TACTICS	COMMENTS
a) develop extension and education programs	Issue news releases to inform the public of upcoming viewing events; prepare and update pamphlets listing and describing viewing opportunities particularly in urban areas
b) develop fish viewing events and areas	Promote the establishment and preservation of streambank buffer zones for non-consumptive enjoyment of fisheries; install displays to improve public knowledge of the resource particularly in urban areas; improve public access to fish viewing areas; encourage incorporation of fish viewing facilities in new projects where feasible

STRATEGY XVIII) PREVENT THE EXTINCTION OF RARE, THREATENED AND ENDANGERED SPECIES

TACTICS	COMMENTS
a) establish the distribution and habitat requirements of these species in Maple District	Through the aquatic habitat inventory program
b) protect areas inhabited by these species from the impacts of development and fishing	Part of plan input and review process and baitfish management program.
c) rehabilitate degraded fish habitat	
d) maintain public awareness of rare, threatened and endangered species	Advise baitfish fishermen about the status and distribution of these species
(e) augment declining populations where feasible, by culture	

A2: SUMMARY OF PUBLIC AND INTERAGENCY INPUT

CHRONOLOGY OF PUBLICITY AND PUBLIC MEETINGS FOR DRAFT PLAN

March 8, 1988: Mailing of news releases and copies of draft plan and/or summary to over 350 anglers, media representatives, angler associations, interest groups, consultants, and government and municipal agencies.

March 19: Ran advertisement in the Sports Section of The Toronto Star to publicize upcoming meetings.

March 20: Ran ad, as above, in The Toronto Sun.

March 21: Public and User Group Meetings held at The Cambridge Motor Hotel, Rexdale, to discuss the draft plan. 60 people attended, including 20 club representatives from Trout Unlimited, Isaac Walton Fly Fisherman's Club, Scarborough Charter Boat Association, Independent Charter Boat Association, Ontario Charter Boat Association, OFAH, Steelhead and Salmon Fisherman, Black Creek Project

March 23: Public Meeting held at the Stephen Leacock Theatre, Keswick, to discuss the draft plan. 24 people attended including representatives from Georginians Against Smelter Pollution (GASP), Lake Simcoe Fish Hut Operators, Orangeville Fishing Club, Town of Georgina, Pefferlaw Angler's Club, Georgina Tourist Committee, OFAH

March 29: Held meetings to discuss the draft plan with government agencies (4 attendees from MOE, MTC) and Conservation Authorities (10 attendees from MTRCA, CVCA, LSRCA).

March 31: Meetings, as above, with Municipalities (17 attendees from Peel, Scarborough, Metro Toronto, Toronto, North York, Etobicoke, Richmond Hill, Georgina, Vaughan, Caledon, Brampton) and Environmental and Engineering Consultants (6 attendees).

April 23: Comments on Maple DFMP by John Power in The Toronto Star

SYNOPSIS OF PUBLIC COMMENTS IN RESPONSE TO DRAFT PLAN

The approximate frequency of response is indicated beside each comment. The possibility of duplication is acknowledged in cases where a comment was recorded during a public meeting, and subsequently submitted in writing on a questionnaire by the same individual.

HABITAT PROTECTION n=3
- maintain wetlands n=1
- control quality of runoff n=2
- limit development close to important watersheds e.g. upper Duffins Creek and Humber River; work in conjunction with municipalities n=3
- protect critical ground water sources n=1
- concerned expressed about runoff from slag (metal contaminants) into the Muskellunge River n=1

REHABILITATION
- improve stream habitat n=3
- consider projects on the Humber River; West Humber River, north of Bolton n=4
- improve spawning habitat in upper Duffins Creek; Rouge River n=2
- consider installation of bottom draw on Elliot and Innis Lakes to minimize warming of water on Centreville Creek (potential for brook trout); also Palgrave Mill Dam on upper West Humber River n=2
- evaluate (and compare) potential of Credit River for rainbow trout and Atlantic salmon production n=1
- change agricultural practices in stream side areas to reduce erosion, nutrient enrichment n=1
- provide clubs with a list of approved rehabilitation projects, by watershed n=2

ENFORCEMENT
- increase number of conservation officers and amount of enforcement effort n=12
  e.g. Credit River - below Norval (snagging, fishing out of season, discarding carcasses after removing eggs)
  - lower Credit e.g. Erindale Park
  Humber River
- more emphasis on enforcing the Federal Fisheries Act and Provincial Lakes and Rivers Improvement Act n=1
- support "Report-A-Poacher" program n=1

REGULATIONS
- change limit for bass in inland lakes from 6 to 3 fish n=1
- impose a creel limit of 3 brook trout above Cataract on the Credit River n=1
- impose a creel limit of 25 perch and 10 herring on Lake Simcoe to prevent overharvest n=1
- increase whitefish limit on Lake Simcoe to attract American tourism
- promote catch-and-release for bass, trout, Atlantic salmon n=8
- support for gear and bait restrictions e.g. fly-fishing only n=2
- implement slot size limits (e.g. for bass, walleye, pike, trout) n=3
- keep Lake Simcoe open to fishing after ice-out (controversy between ice hut operators and local fishermen)
- re-classify lake herring from baitfish to sportfish on Lake Simcoe
- re-examine rationale for stream resident brook and brown trout seasons (e.g. consider year-round season if no-kill regulations in place on Credit

River, Whiteman's Creek) n=1
- close rivers to all fishing during closed season for trout to facilitate enforcement, minimize stress on spawning fish n=2
- encourage removal of social sanctuaries on lower Credit River n=2
- keep social sanctuaries on lower Credit River n=1
- support closure of Credit River to winter fishing above Burnhamthorpe Rd. n=1
- open rainbow fishery on lower Credit (to Eglinton Ave.) all year (or to Dec. 21); extend season on lower Humber River n=1
- extend upper boundary of year round fishing to Hwy 403 on the Credit River (catch-and-release only) n=1
- extend trout and salmon seasons on Rouge River to Steeles Ave. all year
- close Duffins Creek (above Hwy. 2) to fishing after Sept. 30 n=1
- make sale of salmon roe illegal to curtail snagging activities n=1

ETHICS
- snagging, poaching should be combatted with better education and stricter fines n=2
- concerned with variety of infractions on the Credit River within City of Mississauga leading to total ban of fishing for all anglers in this area

CONTAMINANTS
- until contaminant situation reversed, question rationale of stocking lake trout and Atlantic salmon into Lake Ontario n=1
- address issue of leaching of tin and copper-based antifouling paints used on boats n=1
- increase fines for industrial polluters e.g. Rouge River n=2

ACCESS
- improve angler access (shore, boat) n=14
  e.g. Preston, Bond, Musselman Lakes

Credit River	- upstream from QEW
	- downstream from Hwy 5
	- potential loss of access at Hwy 24 due to sale of property on E & W banks
	- investigate purchase of land in Burnhamthorpe Rd./Hwy 403 area
Humber River	- upper west Humber
	- crowded fishing conditions at Old Mill dam
Lake Ontario	- lack of facilities for launching in Pickering area, especially in winter
	- need boat access via ramp installation at foot of Liverpool Road, on spit east of West Shore Blvd., west of Duffins Ck.
Centreville Ck.	
Pefferlaw Bk.	- coldwater zone
Duffins Ck.	- on East Branch, provide parking near Clarmont and Greenwood Conservation Areas for anglers wishing to fish in early morning before parks are officially open; access in headwaters
	- spring-fed feeder lakes and ponds in upper West Duffins, Ressor Ck.
	- Bayley St.; Hwy 401 does not service Church St.

- purchase lakeshore property n=1
- oppose privatization of lakes n=1
- consider controlled angler access permit system; landowner agreements n=2

STOCKING n=2
- consider transfer of adult bass to kettle lakes (e.g. Lake Wilcox, Preston Lake, Musselman Lake) n=2
- consider establishing a bass hatchery n=1
- stock smallmouth bass in the Credit River between Streetsville and Norval in order to establish a self-sustaining population n=1
- decrease and phase-out stocking of lake-run migratory fish e.g. Pacific salmon n=2
- work towards balancing Lake Ontario stocking levels between New York and Ontario n=1
- stock sterile chinook in Lake Ontario n=2
- stock salmon in Rouge River, Duffins Creek to extend chinook season past mid-August in the Whitby to Scarborough area n=2
- stock more coho in Lake Ontario; re-introduce earlier running strain n=1
- do not stock lake trout in Lake Ontario n=1
- stock rainbow trout in Duffins Creek; stock Skamania in Credit River to provide summer fishery; concern expressed regarding proposed reduction of rainbow trout stocking in Lake Ontario n=4
- stock brown trout in upper Duffins Creek, upper Humber River n=3
- consider stocking other species e.g. brown trout, rainbow trout in Lake Simcoe to increase potential for tourism n=2

BAITFISH
- prohibit baitfish harvest in coldwater nursery streams n=1
- concern about accidental introductions n=1

FISHING LICENCES
- procure non-resident (American) angling licence revenues for fisheries management n=1
- increase licence fee n=2
- supplement licence revenues with monies from fishing violation fines, confiscated equipment, sale of species stamps, surtax on fishing related goods n=1
- report breakdown of licence money expenditures, by project type; formula calculating district allotments n=1
- institute a licencing system for fish hut operators n=1

DERBIES
- restrict length of derbies n=3
- place size restrictions of eligible fish n=1
- limit number of fish that can be entered for draw prizes n=1

LAKE ONTARIO
- study forage base n=1
- maximize extent of migratory fish populations (rainbow and brown trout) in tributaries to provide fishing opportunities, encourage natural reproduction n=2
- address contaminant problem n=1

LAKE SIMCOE
- objection to derbies because they do not contribute to the local economy, cause overharvest of fish n=1

SALMONIDS
- concern for migratory fish displacing stream resident trout n=1
- increase range of naturally reproducing brown trout n=1

WARMWATER SPECIES
- consider enhancement of habitat for largemouth bass (e.g. Lake Wilcox) n=1
- establish trophy fishery, special regulations n=1
- assess status of walleye populations in the vicinity of Pickering NGS; consider establishing walleye in the lower Credit and Humber Rivers n=1

EDUCATION
- improve public awareness (brochures, posters, radio, TV); promote ethical fishing mentality n=5

URBAN FISHING
- improve conditions at G. Ross Lord Reservoir and Eglinton Flats Pond for fish and fishing n=1
- stock smallmouth and largemouth bass in ponds as alternative to trout for family fishing
- support Metro Fishing Week n=2
- increase public awareness of potential of warmwater fisheries n=1

INDIVIDUAL ANGLER/CLUB INVOLVEMENT
- executive and members of the Isaac Walton Fly Fisherman's Club, Charter Boat Associations, North Shore Task Force, Trout Unlimited, OFAH, Black Creek Project offered to assist us in a variety of ways
- support for interclub cooperation
- encourage involvement by local industry, schools, youth groups in maintaining urban fishing areas n=1
- involve individuals and groups in enforcement n=3
- involve volunteers in stream rehabilitation e.g. through CFIP n=2

COMMERCIAL FISHING
- ban gillnets n=2
- encourage use of entrapment gear, to allow live release of sportfish

ATLANTIC SALMON
- support reintroduction n=4

HYDRO MICROPROJECTS n=2
- e.g. Huttonville- concern regarding incompatibility of hydro projects with fisheries management objectives

BARRIERS
- partition streams to protect resident fish e.g. support installation of fish barrier at Inglewood; maintain dam on Duffins Ck. (East Branch) at Hwy 7 to protect resident brook trout from migratory fish n=3
- provide fish passage over barriers e.g. lower Humber River (Old Mill Dam; Rouge River (dam at Markham); allow rainbow trout passage above Reid Milling Dam (Streetsville) to increase fishing opportunities in middle Credit River; Pefferlaw Brook Dam n=9
- remove unused dams in rivers e.g. upper West Duffins Ck., Reesor Ck. n=3
- prevent creation of onstream ponds n=1

GENERAL
- require additional funding and manpower to implement plan n=2
- how will the Maple DFMP mesh with the MTRCA program n=1

SYNOPSIS OF AGENCY COMMENTS IN RESPONSE TO DRAFT PLAN

INTERAGENCY COOPERATION

- emphasized need for all agencies to cooperate in the resource planning process n=4
- suggested that MNR should take the initiative in representing fisheries interests in the approval process
- the DFMP is too general; doesn't clearly define relationship between CA's and MNR with respect to issues (tactics) of mutual concern; how do we effectively coordinate in these areas
- overlap in roles, duplication of staff effort, conflicts in program areas perceived between MNR and CA's; expressed need for further CA/MNR discussions to resolve issues n=2
- CA's should be aware of precisely what MNR fisheries interests are in order to streamline the approval process
- suggested DFMP presentations to local councils (politicians) and municipal staff to gain support for fisheries management; encourage adoption of habitat protection guidelines into official municipal plans n=5
- felt MNR cannot successfully sell "fish habitat protection" to politicians, only recreational benefits
- does MNR intend to liase more with the municipalities
- requested one set of guidelines from MNR/CA's to standardize environmental concerns
- MTRCA's urban plan for the Rouge River requires input from MNR, MOE
- liase with MOE regarding water discharge and removal in aquaculture operations (formal MOE approval under the Ontario Water Resources Act)
- what mitigative measures can MTC use to protect fisheries habitat during road construction
- MTC requested better definition of MTC's responsibilities

PLAN INPUT AND REVIEW

- noted the conflicting demands on an aquatic system and need for interagency coordination to streamline the approvals process
- appoint lead agency in approval process
- MNR should take more active role in defending fisheries
- there are too many documents related to environment protection to which planners, municipalities, developers must refer
- in order to minimize confusion and maximize efficiency, the standards in the DFMP should complement those of other agencies
- duplication, contradiction in plan input and review process noted between CA's and MNR
- in order to facilitate (streamline) the approval process for development proposals, CA's need to be more familiar with our concerns, since MNR guidelines to protect fish are different than the CA's guidelines for water management (e.g. flood control) and erosion control
- suggested that a joint plan be formulated to consistently deal with areas of common interest; best developed by watershed and parts of watersheds; if specific guidelines are ratified the CA's will implement and work into their planning framework
- how many MNR staff are occupied with plan input and review
- more funding is required in the plan input and review process
- what is the time frame for MNR to review development proposals and how will it be affected be having the final plan in place
- provide site specific recommendations
- concerned with blanket application of "no net loss" and vegetative buffers to all development proposals equally
- developers reluctant to bear extra costs associated with fisheries habitat protection

- requested more direct input at the approval stage, not "after the fact"
- general concern that MNR applies the same construction guidelines to streams of all levels of quality, thereby decreasing credibility in important areas
- we need to present justification (rationale) for the guidelines presented in the plan, with respect to fisheries

STORMWATER MANAGEMENT
- concerned with stormwater management section of plan (quality and quantity of water); when will MNR have more specific guidelines
- who will take responsibility for stormwater quality
- MOE sets standards for water quality; MESA
- coordinate DFMP with urban drainage study
- Urban Drainage Committee, technical documentation e.g. basis for selection of stormwater pond design criteria; other studies addressing water quality e.g. TAWMS (MOE), MISA (MOE), Rural Beaches (MOE et al), NURP (USA), WRAP/RAP, Rouge River Watershed Urban Drainage Plan (MTRCA)
- City of Mississauga acknowledged importance of stormwater management and roles of the municipality, CVCA, MNR and MOE (referred to municipal report "Status of Water Pollution Control Studies and Programs in Ontario", Lakefront Water Quality Committee, CVCA Master Drainage Study for the Credit River Watershed)
- MOE has been involved with some MNR districts (e.g. Bracebridge) to draft a plan to address water quality problems at time of dredging and landfilling
- use Urban Development Institute to arrange forums for discussion with the development industry to facilitate understanding of fisheries objectives; demonstrate successful techniques for stormwater management with appropriate data and example sites; show benefits derived
- will we be demanding installation of retroactive stormwater treatment facilities
- e.g. there are currently stormwater outfalls in the Humber River, with very little room for ponds, expensive to change to allow some treatment (sediment, contaminants) prior to discharge into watercourse
- noted that Toronto, with development so concentrated, has little space available for settling ponds etc.
- cost of stormwater treatment prohibitive
- costs of water management high- MNR should refer to TAWMS (Toronto Area Watershed Management Strategy Study) and MISA (Municipal Industrial Strategies for Abatement), and work closely with MOE to satisfy stormwater management concerns
- discussed problems with separation of sewer and stormwater drainage
- conflict between water uses e.g. discontinue chlorination of water during winter to minimize toxic residues, but may negatively affect recreation i.e. use of beaches
- biological assessment of effluent is being considered to investigate the synergistic effects of all contaminants
- use mitigative measures in design and construction of on-stream ponds and dams as alternative to prohibition; use cost/benefit analysis to assess each case
- how does stormwater management (e.g. prohibition of untreated water flowing into watercourses) deal with runoff from roads and highways (with its load of salt and other contaminants)
- provide written explanation of stormwater management guidelines
- concerned re: implementation of plan in existing urban areas, particularly with regard to retroactively creating retention/detention ponds; implied that MNR is overstepping its mandate by tactic that prohibits inflow of untreated stormwater
- questioned capture of stormwater before discharge into rivers

- with regard to prohibiting inflow of untreated stormwater, the scale of development (and hence the quality of stormwater) should be a deciding factor
- how does municipality deal with planning (stormwater management etc.) for anticipated development in the Lake Ontario/Lake Simcoe divide
- how can stormwater be used to "create" fisheries
- source and validity of sediment control component of the stormwater management guidelines (40 microns) questioned; how does it relate to fisheries concerns and water quality (e.g. contaminant removal)

VEGETATIVE BUFFERS
- how were widths of vegetative buffer strips determined; what measurable benefits will they achieve
- need more rigorous definition of stream bank/top of bank in relation to width of vegetative buffer strips
- differences in definition of setback noted between MNR and CA's
- will buffers be required for all types of construction
- intent of strategies endorsed, but implementation of a 15 m vegetative buffer strip difficult for development on tributaries of the Credit River such as Mullet Creek, Carolyn Creek
- how are vegetative setbacks measured (high vs. low water mark) - what activities will be allowed there
- suggestion that implementation will prove to be difficult, since buffer occupies land that developer wishes to use for development
- will vegetative buffers be applied to road crossings

NO NET LOSS OF HABITAT
- more clearly explain concept, how it will be applied; how is amount and type of equivalent habitat defined; how is existing habitat value determined; how will it be enforced n=4
- develop expertise in ways of implementing "no net loss" of habitat

CONSTRUCTION TIMING
- clarify dates directing construction guidelines
- noted that construction guidelines have also been established by MOE to protect other interests e.g. domestic and recreation peaks June to August
- concerned with limited construction season and application of same guidelines on all streams without sufficient regard for differences in habitat quality, fisheries potential, type of fish community (e.g. warmwater resident gamefish community is treated same as warmwater minnow community)
- discrepancies noted between MNR and CA construction timing guidelines; define exactly which portions of each watershed will be considered as coldwater migratory, warmwater resident etc. so that these guidelines can be applied effectively

ENFORCEMENT n=4
- how does MNR enforce adherence to conditions of approved development proposals with regard to fish habitat
- ensure that field inspections occur during plan review and later to monitor compliance to conditions set in plan approval process

EDUCATION
- supports fisheries education programs, especially those directed at children; present coarse fish as alternatives
- Cities of Mississauga and Scarborough are proposing establishment of fisheries education centres

REHABILITATION
- stressed importance of maintaining, enhancing fish habitat in urban areas
- felt habitat rehabilitation and protection of stocks during critical periods should be considered as high priority management tactics
- initiate special projects to rehabilitate the Rouge River for various activities (e.g. recreation, fishing, viewing), in conjunction with municipality
- interest expressed in Atlantic salmon program, increase in fly-fishing only areas
- if we wish to apply fisheries protection guidelines to degraded streams, then we should have a structured plan for rehabilitation
- LSRCA seeking MNR funding support for staff involvement in stream rehabilitation (CA will continue to contribute capital costs)

WETLANDS
- when we classify wetlands, is it from a fisheries perspective
- concerned that wetlands may be of significant interest on a local (municipal) level, but MNR may not provide full protection if it is rated lower than Class IV in the Provincial Wetland Classification System
- will smaller wetlands close to urban centres be considered for protection

LEGISLATION
- will MNR be applying fisheries legislation to a greater extent during the implementation of the DFMP
- cite the enabling legislation in the plan for reference
- MNR should apply the Lakes and Rivers Improvement Act more stringently where flood and erosion concerns are minimal, but fisheries are significant

IMPLEMENTATION
- plan is too general, particularly the implementation schedule
- concerned by application of same strategies and tactics to watercourses of different fisheries values
- what criteria will be used to set priorities for implementation, level of fisheries management activity on various watersheds (based on angling effort?) n=2
- set targets for, and prioritize tactics and implementation activities within and among individual management zones n=4
- produce document explaining to developers the rationale for stream protection (particularly above and beyond the more obvious sportfish value)

FUNDING/STAFFING
- concern that insufficient levels of funding and manpower will prohibit effective implementation n=4

TECHNICAL/SCIENTIFIC ISSUES
- establish warmwater fisheries in areas that are currently marginal coldwater fisheries facing high development pressure
- is it practical to suggest redoing complete stream surveys every 5 years
- why is the projected increase in fishing effort so small for warmwater zones and inland lakes, given the increasing population and need to provide opportunities for anglers of all economic situations
- compile database to analyse success of recommended techniques (i.e. those relating to development proposals)
- prohibit baitfish harvest in areas known to have redside dace
- how does fishing rank among other recreational activities associated with water (data available?)
- prepare a fisheries plan specifically for the Rouge River (and each of the other watersheds, in turn); the DFMP doesn't give specific objectives for

the Rouge River fishery, and what priority it is given in the framework of the plan
- investigate impact of introduction of smallmouth bass on juvenile migratory salmonids in the Streetsville to Norval section of the Credit River
- overall technical merit of the DFMP challenged

CONTAMINANTS
- what are the contaminant levels in coarse species; are these species likely consumed

MISCELLANEOUS
- the DFMP provides consultants with an opportunity for promoting MNR initiatives early in the developer's planning process

MAPLE DISTRICT

QUESTIONNAIRE FOR PUBLIC REVIEW OF DRAFT FISHERIES MANAGEMENT PLAN

1. In your opinion, is any relevant information missing or incorrect in the Draft Plan? Please be specific.

_____

_____

_____

_____

2. Are there specific fisheries or angling problems in Maple District that you would like to bring to our attention? Please answer using the format in the example below.

Water Body	Problem	Comments/Solution

3. Describe **additional** management tactics or actions (i.e. ones that have not been included in the Draft Plan) that you would like to see implemented in the final District Fisheries Management Plan. Please indicate to which management zone or water body your suggestion applies. Use the other side of this page if necessary.

_____

_____

_____

_____

4. What fisheries management tactics or actions do you feel should receive high priority from the Ministry of Natural Resources in Maple District?

_____

_____

_____

_____

5. In which of the following waters do you fish?

	CHECK
Credit River:	
above Inglewood	☐
Inglewood to Norval	☐
below Norval	☐
Humber River:	
above Bolton	☐
below Bolton	☐
Rouge River	☐
Duffins Creek	☐
Lake Simcoe	☐
Holland/Maskinonge Rivers	☐
Black River	☐
Pefferlaw Brook	☐
Beaverton/Talbot Rivers	☐
Lake Ontario	☐
Inland Lakes and Ponds	☐
Others in Maple District (specify)	☐ _____

6. Indicate which categories apply to you. Specify club(s) or association(s) where applicable.

	CHECK	CLUB/ASSOCIATION
Boat angler	☐	_____
Shore angler	☐	_____
Charter Boat Operator	☐	_____
Commercial Bait Fisherman	☐	_____
Commercial Fisherman	☐	_____
Fisheries-related business	☐	_____
Other (specify)	☐	_____

7. Indicate the 3 **warmwater species** for which you prefer to fish in Maple District (1=most preferred, 2=second preference, 3=third preference). Enter the appropriate number beside your 3 choices.

No preference (check)	☐
Largemouth bass	☐
Smallmouth bass	☐
Panfish (pumpkinseed, crappie, rock bass)	☐
Carp	☐
Northern pike	☐
Walleye	☐
Bullhead	☐
Yellow perch	☐
Other (specify)	☐ _____

8. Indicate the 3 **coldwater species** for which you prefer to fish in Maple District (1=most preferred, 2=second preference, 3=third preference). Enter the appropriate number beside your 3 choices.

No preference (check)	☐
Brook trout	☐
Brown trout	☐
Rainbow trout	☐
Lake trout	☐
Coho	☐
Chinook	☐
Atlantic salmon	☐
Lake whitefish	☐
Lake herring	☐
Smelt	☐
Other (specify)	☐ _____

9. Did you attend one of the public meetings held to discuss the draft Maple District Fisheries Management Plan? _____

How did you learn of this meeting? _____

10. Do you wish to be included on our mailing list so that you may be advised of future public meetings concerning the development of the Maple District Fisheries Management Plan?

Name: _____

Address: _____

Postal Code: _____

Phone Number: _____

Business/Club Affiliation: _____

11. Please write any other comments in the space below.

_____

_____

_____

_____

_____

_____

_____

_____

THANK YOU FOR YOUR INTEREST AND CONTRIBUTION TO FISHERIES PLANNING IN MAPLE DISTRICT.

Please return the questionnaire in the envelope provided by **April 6, 1988.**

Other correspondence relating to the Fisheries Management Plan can be sent to:

District Manager
Ontario Ministry of Natural Resources
Maple District Office
10401 Dufferin St.
Maple, Ontario
L0J 1E0

A3: SUMMARY OF CURRENT FISHERIES MANAGEMENT PROGRAMS IN MAPLE DISTRICT 1983 - 1987

ACTIVITY			ANNUAL AVERAGE 1983 - 87
A) PLANNING			
Management Plans			1
Municipal Plan Input and Review			approx. 1500
B) ENFORCEMENT			
Enforcement Effort (person days)			523
C) POPULATION MANAGEMENT			
Fish Ladder Operations			3
Fish Planted by species		Water body	
(i)	Coho	L. Ontario	117,684
(ii)	Chinook	L. Ontario	193,965
(iii)	Brown Trout	L. Ontario	29,185
(iv)	Lake Trout	L. Simcoe	111,094
(v)	Rainbow Trout	L. Ontario	105,287
(vi)	Brook Trout	Bogart, Duffins Cks.	2,650
(vii)	Whitefish	L. Simcoe	21,776
Stream survey and assessment projects			1 in 1987
Baitfish licences			
harvest licence			79
dealer's licence			75
preserving licence			57
Scientific collector's permits			31
D) LAKE SIMCOE FISHERIES ASSESSMENT UNIT			
Harvest Assessment Projects			1
Index Netting Projects			1
Water Testing Projects			1
Egg Collection Projects			2
Nonrecurring Studies			
- Littoral Zone			1 in each of 1985-87
- Pike Habitat			1 in each of 1983,84
- Feeding Habits			1 in 1983
- Limnetic Zooplankton			1 in 1983

E) LAKE ONTARIO FISHERIES ASSESSMENT UNIT
(Within Maple District)

Harvest Assessment Projects	2
Salmon Growth Studies	1
Lamprey Marking Incidence Studies	2
Salmon Diet Studies	1
Salmon Forage Base Studies	
- Smelt	1
- Alewife	1
Salmon Smolt Studies	1
Lake Trout Netting Studies	2

F) CREDIT VALLEY CONSERVATION AUTHORITY

Harvest Assessment Projects	1
Stream Assessment Projects	2
Fish Biomass Assessment Projects	1
Stream Rehabilitation Projects	6

G) SOUTH LAKE SIMCOE CONSERVATION AUTHORITY

Stream Assessment Projects	2
Stream Rehabilitation Projects	16

H) METROPOLITAN TORONTO AND REGION CONSERVATION AUTHORITY

Stream Survey and Assessment Projects	8
Stream Inventory Projects	2
Harvest Assessment Projects	1

I) LAKE SIMCOE ENVIRONMENTAL MANAGEMENT STRATEGY STUDIES

Open Lake Water Quality Studies	1
Holland River Water Quality Studies	1
Tributary Water Quality Studies	1
Provincial Water Quality Network Studies	1
Water Works Monitoring Studies	1
Special Eutrophication Studies	1

J) FISHERIES SERVICES

Urban Fisheries Project	1
Fisheries Workshops	3
Fisheries Displays	2
Fishing Outing For Handicapped Children	1
School Presentations	23
News Releases	3
TV and Radio Interviews	4
CFIP Projects	1
Time on Pond Extension	0.1 person yrs.
Time on Public Fisheries Complaints	0.6 person yrs.

A4: LEGISLATION RELEVANT TO MANAGEMENT OF FISHERIES AND FISH HABITAT IN ONTARIO

Leglislation	Agency	Provisions dealing with fisheries and fish habitat
Fisheries Act	Fisheries and Oceans Canada/ OMNR	regulates activities affecting fishes and fishable waters
Ontario Fisheries Regulations	OMNR	fisheries management requirements pursuant to the Federal Fisheries Act
Lakes and Rivers Improvement Act	OMNR	regulates activities affecting lakes and rivers in the province of Ontario
Game and Fish Act	OMNR	regulates the capture, sale and possession of fish
Ontario Planning and Development Act	OMMA	provides for preparation and review of development plans
Conservation Authorities Act	Conservation Authorities	provides for regulation of floodplain activities, ravine filling
Navigable Waters Protection Act	Transport Canada	regulates works built on, over, through or across any navigable water
Beds of Navigable Waters Act	OMNR	the bed of any navigable water is Crown land
Beach Protection Act	OMNR	regulates removal of sand and gravel from beaches
Drainage Act	OMAF	permits individuals and municipalities to initiate and maintain drainage works
Public Lands Act	OMNR	regulates various types of development on public lands
Ontario Water Resources Act	OMOE	regulates discharges into waterbodies, and withdrawal of water
Environmental Assessment Act	OMOE	provides for assessment of the effects on the environment of public and private projects
Municipal Act	Municipalities	regulates approvals for construction over public shores and waters

A5: VEGETATIVE BUFFER ZONES

DEFINITION

A permanent setback established along the shoreline or streambank which remains in, or is to be returned to a self-sustaining vegetated state

Guidelines:

- 15 m, measured horizontally outward from the streambank, for non-sensitive streams (consider soil type, topography, fish community and habitat)
- 30 m, measured horizontally outward from the streambank, for sensitive streams (e.g. those that support coldwater fisheries, have sensitive soil conditions, critical habitat types)
- 9 m from top of bank of any steep slopes occurring within either of the setbacks above
- lesser setbacks may be considered (subject to approval by District Manager) if it can be demonstrated that fish and fish habitat will not be detrimentally affected e.g. in highly urbanized areas where fisheries potential is insignificant, in instances where other items such as flood control take priority, or where a well defined valley (without steep slopes) or floodplain demarcates a natural buffer zone

To protect buffer zone during construction:

- prevent movement of construction equipment and disposal of material in the zone, using snowfence fronted by straw bales or geotextile fabric to mark limits of buffer
- avoid damage to vegetation
- minimize flow of sediment into the zone during construction

Permitted uses in vegetative buffer zones:

- passive/low intensity activities (e.g. hiking, cross country skiing, fish and wildlife viewing, fish and wildlife management projects)
- construction of low impact structures (e.g. footbridges, paths)
- essential service linkage (e.g. roads, electrical lines, pipelines)

RATIONALE

Development can adversely affect fish by:

- removing vegetation which diminishes available cover, increases water temperatures, eliminates habitat for terrestrial insects, increases potential for erosion, sedimentation and alteration of flow
- increasing erosion and sedimentation can foul spawning beds, reduce habitat for benthic organisms, increase turbidity, and increase inflow of nutrients thereby increasing biological oxygen demand
- decreasing water quality by input of nutrients and contaminants via stormwater runoff
- disrupting streamflow characteristics by construction of barriers (e.g. dams)

Benefits of a vegetative buffer:

- moderates water temperature
- filters sediment, nutrients, certain contaminants
- reduces rate of surface runoff
- helps to control bank erosion
- contributes food for fish
- provides cover for fish
- creates wildlife habitat
- buffers stream from some human activities

- enhances property values
- provides potential for passive or low intensity types of recreation
- improves aesthetics
- gives low maintenance landscape
- can reduce necessity for expensive structural bank stabilization

Criteria used to establish buffers included:
- wide enough to benefit stream and fish
- straightforward to facilitate consistent interpretation and application by MNR staff (as well as other agencies)
- reasonable width so that it does not preclude the landowner's ability to develop his land in the context of the development objectives expressed in the municipal official plan
- reasonably consistent with setbacks required by other agencies
- provision for flexibility

DOCUMENTATION

Ontario Ministry of Natural Resources. **Guidelines on the Use of Vegetative Buffer Zones to Protect Fish Habitat in an Urban Environment.** Central Region, September 1987. 36 pages.

- presents literature review, based largely on studies of impacts of forestry and agriculture

Barton, David R., William D. Taylor and R. M. Biette. **Dimensions of Riparian Buffer Strips Required to Maintain Trout Habitat in Southern Ontario Streams.** North American Journal of Fisheries Management 5:364-378, 1985.

- determined water temperature was major factor dictating trout distribution
- concluded length and width of buffer zones could be derived empirically, based on maintaining weekly maximum temperatures less than 22° C

- also refer to **Ministry Plan Input and Review Handbook**

LEGISLATION
- federal Fisheries Act (e.g. section 31 which prohibits any work or undertaking that results in the harmful alteration, disruption or destruction of fish habitat)
- Planning Act
- Lakes and Rivers Improvement Act

- MNR implements through plan input and review process and may request modification to proposals such as application of special techniques or design criteria to minimize adverse impacts on fisheries
- municipalities must recognize, support and make provision for vegetative buffer zones, since they play a major role in land use planning (i.e. official plans)
- limitation- no legislation to prohibit landowners from removing vegetation from this zone after construction is completed; requires education regarding value of maintenance

GUIDELINE EVALUATION
- discuss intent and clarify application of these guidelines with Conservation Authorities and municipalities (e.g. position of lot lines relative to buffer zones; allowable activities within buffer zones); resolve differences in terminology (e.g. setback vs. buffer zone; top of bank vs. streambank; zone vs. strip)
- evaluate and map, by watershed, width of buffer required for each section

of stream, based on fisheries concerns; negotiate where these buffers differ significantly from those that satisfy the concerns of other agencies (e.g. Conservation Authority floodlines)
- refine guidelines if appropriate, as new literature published
- encourage Fisheries Branch to recognize vegetative buffers as being important for promotion on a provincial scale
- develop an education package explaining the value of vegetative buffers to developers and landowners
- seek legal means of protecting vegetation within a buffer after construction phase is complete

A6: NO NET LOSS OF FISH HABITAT

DEFINITION
Strive to balance unavoidable habitat losses with habitat replacement on a project-by-project basis.

Procedure for applying no net loss:
- notification of proposal e.g. through plan input and review process
- examination of impacts (minor projects by MNR including site inspection; major projects by proponent)
- conduct public consultation, if necessary
- make decision, with appropriate conditions placed on approval
- audit for compliance and evaluate effectiveness of technique
- enforcement of legislation, by trained personnel

Guidelines:
- will apply to all activities, large and small, in or near water, that could alter, disrupt or destroy fish habitats, by chemical, physical or biological means
- each development, major or minor, will be evaluated in the planning phase to determine if it will result in a reduction of the capacity of the fish habitat to sustain fisheries resources
- recognize the need to avoid cumulative habitat losses caused by small projects
- will not be applied retroactively to approved or completed projects
- does not signify that all proposed activities, in or near water, have to be stopped, or that unreasonable demands will be imposed on their design, construction, operation
- however, where productive capacity of habitats is very high, no loss of habitat and no degradation of water quality will be permitted (as per the local fish habitat management plan)
- degree of habitat protection based on actual or potential contribution to fisheries on a national level and importance to local fisheries management objectives
- potential adverse effects on fish habitats can often be avoided by modifying plans, designs, operation of activities and incorporating reliable mitigation and compensatory techniques
- only if it proves impossible (or impractical) to maintain the same level of habitat productive capacity, will we consider compensatory options (replacing habitat near site, off-site replacement of habitat, increase in habitat capacity at site)
- only in extreme cases will compensation take the form of artificial production to supplement the fishery

Role of proponent:
- proponents may be asked to provide an environmental impact statement (EIS) for major projects, so that we may assess the potential effect of proposed activities on the fisheries resource; may use our studies as a source of information
- proponents will bear cost of preparing an EIS, mitigating any anticipated damages, and implementing compensatory measures designed to avoid losses of fish habitat and reductions in supply of fish

RATIONALE

Threats to fish habitat include:
- industrial and municipal effluents, stormwater runoff
- stream diversions, channelization, piping, stormwater outfalls

- introduction of sediment
- barriers to fish movement
- alteration of flow
- nutrient enrichment
- chemical contaminants
- elevated water temperatures

3 goals of this habitat management policy:
- maintain habitat under guiding principle of **no net loss**
- rehabilitate fish habitat
- create fish habitat

8 strategies to implement this habitat management policy:
- ensure protection of fish habitat and compliance to conditions specified in the Fisheries Act
- practise integrated resource planning
- conduct scientific research to improve technology relating to fish habitat
- include public consultation for controversial issues
- promote public education
- focus on interagency cooperation
- encourage participation of interest groups in habitat rehabilitation
- monitor and evaluate effectiveness of techniques used

DOCUMENTATION

Department of Fisheries and Oceans. **Policy for the Management of Fish Habitat.** Department of Fisheries and Oceans, October 1986. 30 pages.

- federal policy, written by the Department of Fisheries and Oceans, to manage fish habitat in a way to achieve a **net gain**

LEGISLATION

- where provincial agencies manage the fisheries (i.e. in Ontario), the adoption of the policy will occur through Federal-Provincial agreements - Canada-Ontario agreement on habitat management was signed in April, 1988, (Ron DesJardine, pers. comm.); details, to clarify provincial responsibilities and means of implementation, have yet to be worked out (Ray Biette, pers. comm.)
- policy will guide administration of the habitat protection portions of the **Fisheries Act** (sections 20, 28, 30, 31, 33)
- the **Fisheries Act** contains powers to deal with damage to fish habitat, destruction of fish, obstruction of fish passage, necessary flow requirements for fish, the screening of water intakes and the control of deleterious substances
- **fish habitat** is defined under the federal **Fisheries Act** (section 31.5) as "spawning grounds and nursery, rearing, food supply and migration areas on which fish depend, directly or indirectly, in order to carry out their life processes"
- includes all life stages of fish
- above documentation recognizes the limitations of the **Fisheries Act** in controlling activities, such as land use developments, that impact on an ecosystem-wide level
- no net loss principle is intended to guide habitat management, and is not a statutory requirement to be met at all costs and in all circumstances; use informed, professional judgement

GUIDELINE EVALUATION

- keep informed about completion of related reports- as part of the implementation of the policy, the Department of Fisheries and Oceans is considering compiling "A Guide to Achieving No Net Loss", "Assessment Procedures for Evaluating Fish Habitat", "Restoration and Development Guidelines"
- seek provincial direction from Fisheries Branch to ensure consistent application of this guideline (consider workshop)
- investigate available means of habitat replacement and mitigative measures; evaluate effectiveness of those applied locally
- increase enforcement effort and expertise in the area of habitat protection

A7: CONSTRUCTION TIMING GUIDELINES

DEFINITION
Direct the timing of development activities in and around water.

Guidelines
Instream or lakeshore work permitted as follows (all dates inclusive):

LAKE SIMCOE
Coldwater habitat and spawning shoals- July 1 to September 15
Warmwater nearshore habitat- July 1 to March 31

LAKE ONTARIO
Nearshore areas- will be evaluated on a case-by-case basis

STREAMS

Migratory corridors for salmonids (including river mouths on Lake Ontario)- No timing restrictions will be applied

Production zone (spawning/nursery habitat) for migratory salmonids- June 15 to September 15

Production zone (spawning/nursery habitat) for resident salmonids- June 1 to September 15

Migratory corridors and production zones (spawning/nursery habitat) for warmwater species- July 1 to March 31

RATIONALE
- construction activities will be timed mainly to:
    - protect spawning fish
    - maintain viability of incubating eggs
    - minimize disturbance at least until time of fry emergence
- guidelines have been established for salmonids (coldwater species) and warmwater species, and 2 types of habitat: migratory corridors and production zones (spawning/nursery habitat)
- timing guidelines will protect the most sensitive fish community type (i.e in instances where more than one community type utilize the same section of stream during all, or part, of the year)
- will be used in conjunction with sound project designs (including state-of-the-art stormwater management), appropriate mitigative construction techniques (e.g. sediment controls), maintenance of vegetative buffer zones, and timely site rehabilitation to ensure protection of fish and fish habitat during and after construction
- we recognize need for flexibility, use of judgement on individual proposals depending on the nature of the project and the physical and biological attributes of the site
- also necessary to allow for the seasonal variability in timing of fish migration, spawning and emergence (if potential concerns can be anticipated at the time of plan review and approval, which is usually well in advance of the construction date)
- it is believed that timing restrictions to protect migrating salmonids are not normally necessary, since prolonged obstruction to fish passage has not occurred as a result of construction projects in the past, and since full sediment control is one of the conditions placed on approval

DOCUMENTATION

Ontario Ministry of Natural Resources. **Maple District Guidelines for Nearshore and Instream Construction.** Maple District, in preparation.

Ontario Ministry of Natural Resources. **Fisheries Resources Maps.** Maple District, 1985.
- on file in the planning section of the Maple District Office
- series of 6 maps that delineate, for district streams, potential coldwater fisheries, coldwater fisheries, warmwater fisheries, warmwater fisheries with coldwater migratory run, and warmwater fisheries with warmwater migratory run
- represents a composite of district fisheries survey information, personal observations by biologists and Conservation Officers, available reports (see file SF1 8.0 for documentation)
- note that not all streams (and tributaries) have been surveyed to the same extent, but that inferences about fisheries can often be made by looking at survey results for other sections of stream in close proximity to the unsurveyed area
- maps require regular review and update as new information becomes available, fisheries management programs change, additional observations made
- also refer to Figures 3 and 4 in this document

Credit Valley Conservation Authority. **Procedures and Guidelines for Alterations to Waterways.** July 1982 (last revised December 1984).

Ontario Ministry of Natural Resources. **Policy and Criteria for Shoreline Improvement on Crown Land, on the South Shore of Lake Simcoe (from Cook Bay to the Talbot River).** Maple District, February 1983.

Ontario Ministry of Natural Resources. **Policy and Criteria for Shoreline Improvement on Crown Land, Lake Ontario (Clarkson to Ajax).** Maple District, February 1983.

LEGISLATION
- applications for construction works in and around streams are generally reviewed under the Lakes and Rivers Improvement Act
- other pertinent legislation includes the federal Fisheries Act and the federal policy for management of fish habitat (e.g. principle of no net loss)

GUIDELINE EVALUATION
- in conjunction with the Conservation Authorities and other districts within Central Region (or districts with which we share watersheds), amend guidelines as necessary and document rationale to ensure consistency of application. Consider, for example:
    - the Atlantic salmon program: timing of migration and spawning, location of spawning habitat, degree of success of reproduction
    - changes in management strategies (e.g. possibly allowing rainbow trout passage above Streetsville on the Credit River)
    - new biological information regarding variability in the timing of spawning and emergence for salmonids and warmwater species (e.g. smallmouth bass, walleye) in various watersheds
    - updated species distribution data
    - relevant literature
- continue to refine watershed maps as new information becomes available
- consider breaking down warmwater resident communities into 2 categories to take into account present quality and potential of fishery (i.e. minnow

community with low diversity and few, if any, sportfish that is characteristic of degraded urban streams vs. a more diverse community that includes sportfish and species indicative of good water quality)
- over the long term, develop a steam classification system, based on an appropriate index equation- this would allow streams to be assessed quickly and effectively using a few key parameters (e.g. temperature regime, diversity or presence of indicator species, soil type etc.)
- circulate amended and approved guidelines to municipalities and developers

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